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The Mining Journal

LONDON, SEPTEMBER 2, 1960

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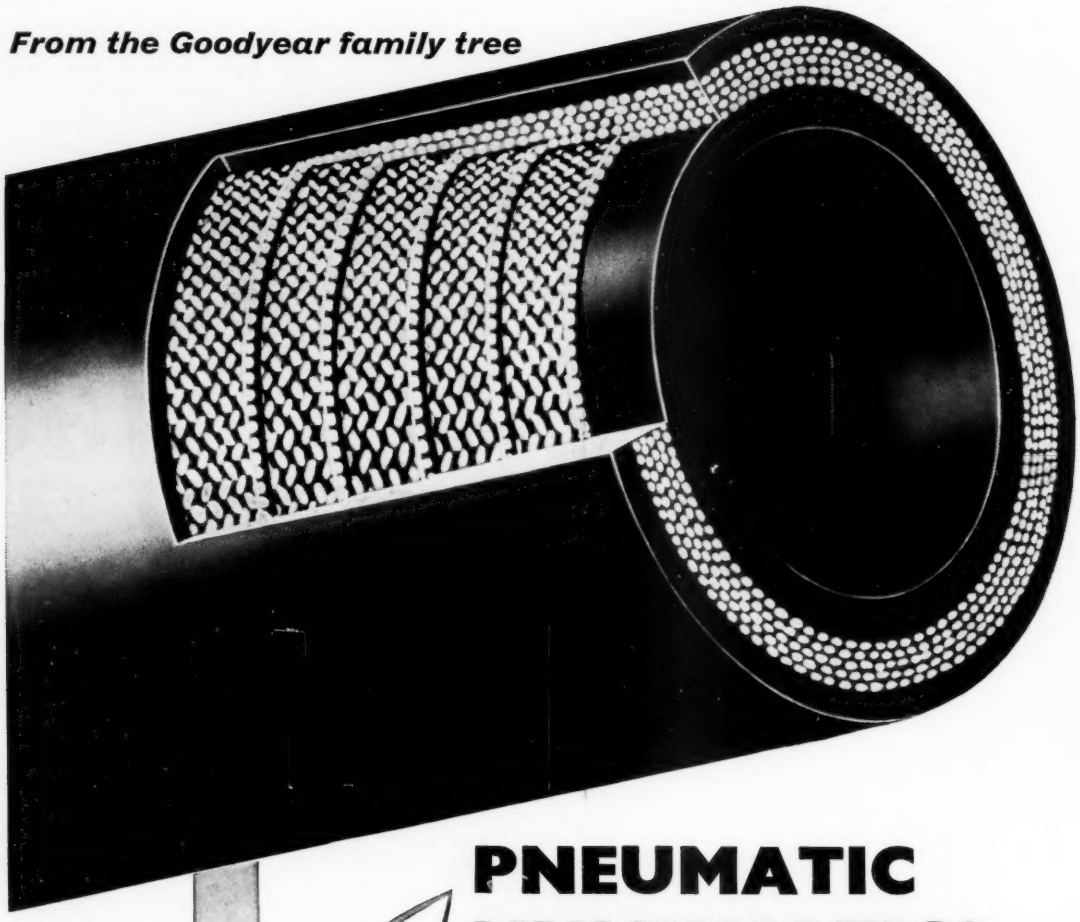

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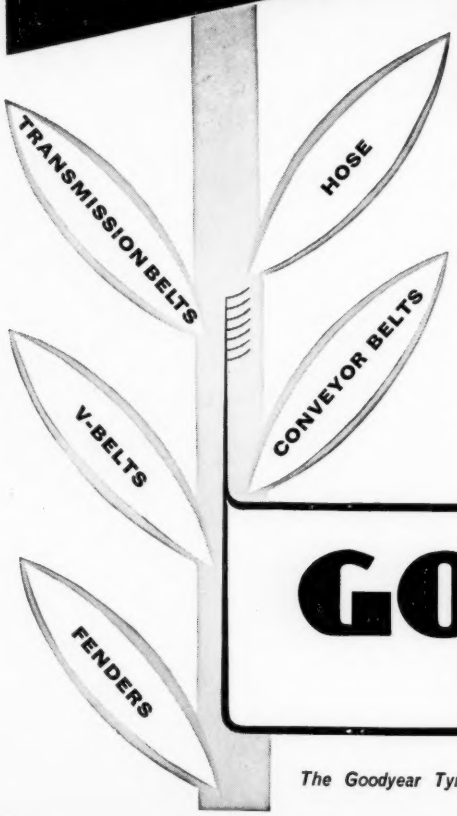

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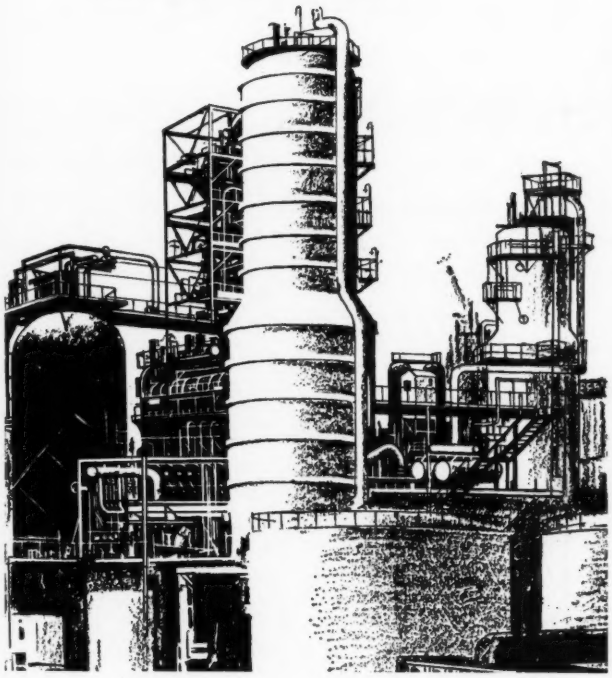
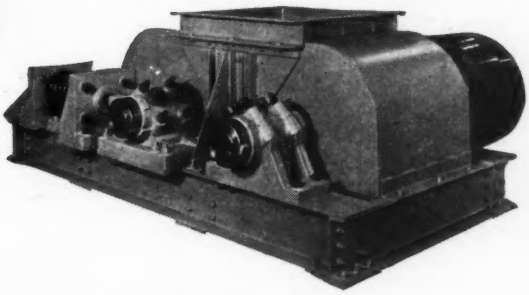
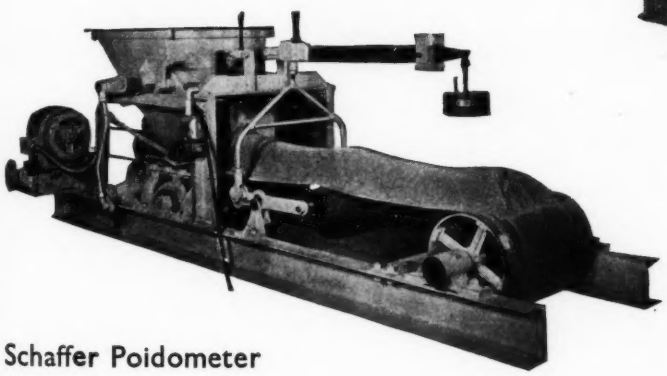


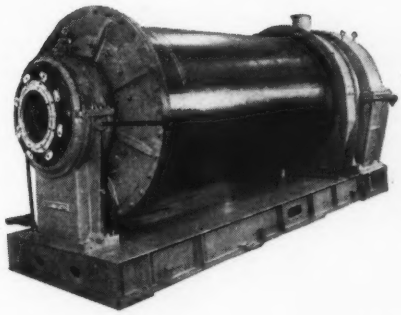
Gyratory Crushers.
Roll Crushers.
Swing Jaw Crushers.
Cuber Crushers.
Schaffer Poidometers.
Ball and Rod Mills.
Chemical Handling Plant.



Roll Crusher



Schaffer Poidometer



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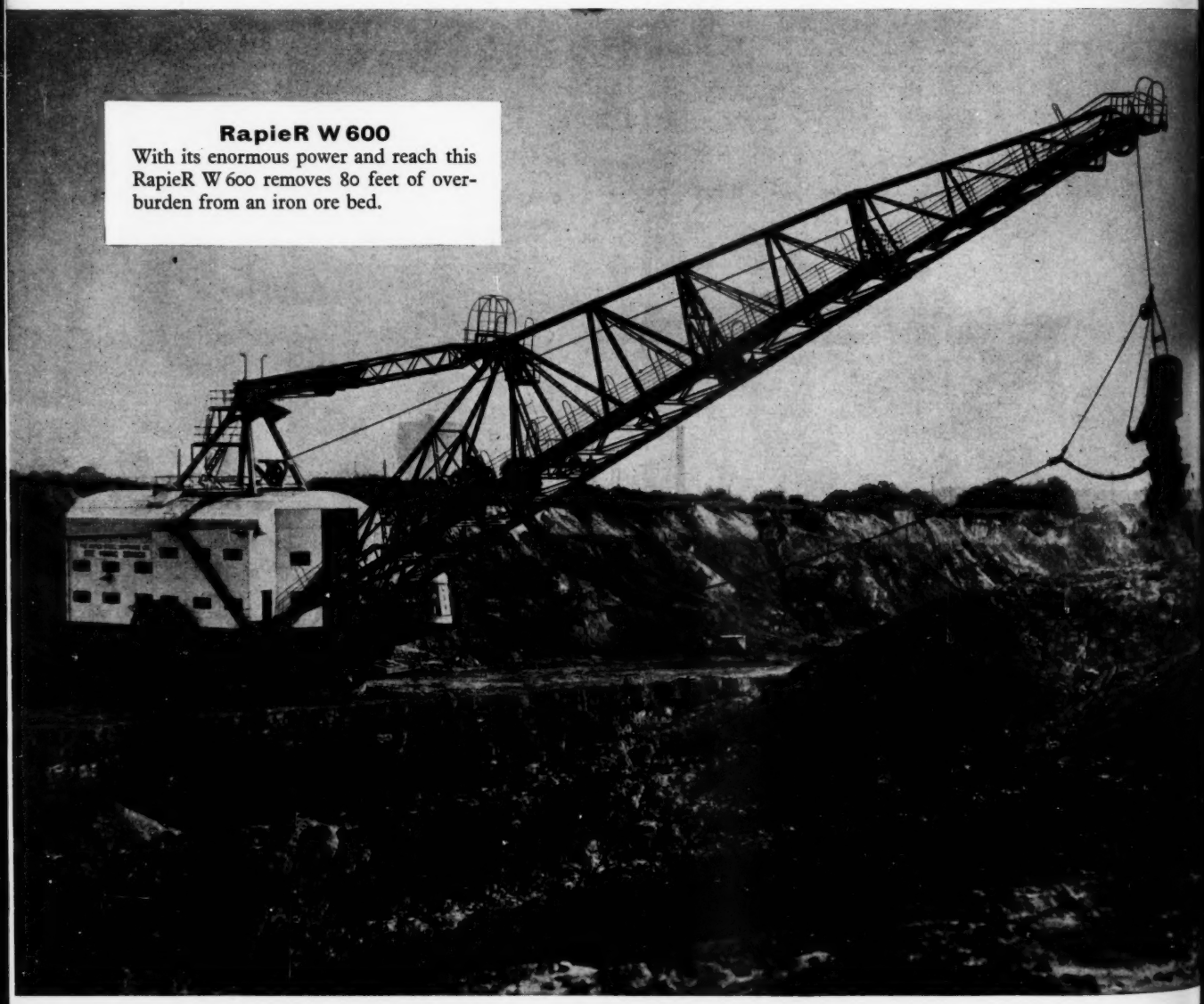

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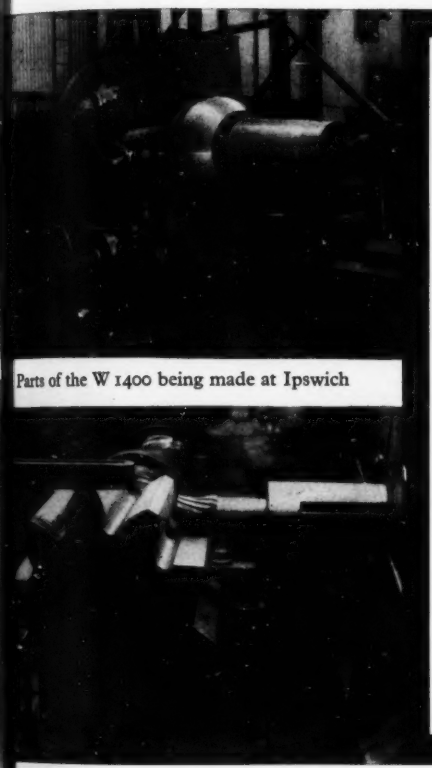
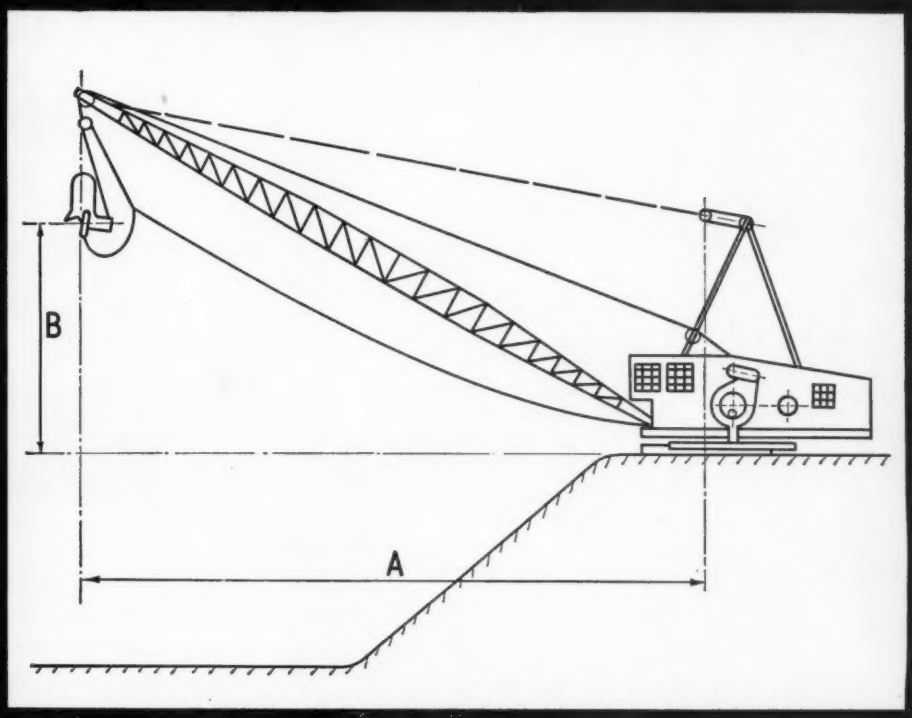


Parts of the W 1400 being made at Ipswich



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	132′ 0″	4 to 5	132′ 0″	35′ 0″	189
	121′ 0″	5 to 6	118′ 0″	38′ 0″	186
	121′ 0″	6 to 7	105′ 0″	57′ 6″	184
W 300	180′ 0″	5 to 6	178′ 0″	70′ 0″	375
	140′ 0″	7 to 8½	142′ 0″	52′ 0″	375
W 600	204′ 9″	8 to 10	201′ 0″	72′ 0″	792
	186′ 0″	10 to 12	184′ 0″	65′ 0″	777
	165′ 0″	12 to 15	165′ 0″	55′ 0″	776

TYPE	LENGTH OF BOOM	BUCKET CAPACITY CU. YD.	DUMPING RADIUS A	DUMPING HEIGHT B	WEIGHT IN TONS
W 900	247′ 0″	16	230′ 0″	100′ 0″	950
	229′ 6″	18	215′ 0″	90′ 0″	
	195′ 0″	23	185′ 0″	76′ 0″	
W 1350	271′ 0″	20 to 24	250′ 0″	112′ 0″	1375
	248′ 0″	29	230′ 0″	100′ 0″	
	230′ 0″	33	215′ 0″	90′ 0″	
W 1400	282′ 0″	20 to 24	260′ 0″	140′ 0″	1650
W 1800	303′ 0″	20 to 24	280′ 0″	150′ 0″	1850
	282′ 0″	30	260′ 0″	120′ 0″	
	247′ 0″	40	230′ 0″	100′ 0″	

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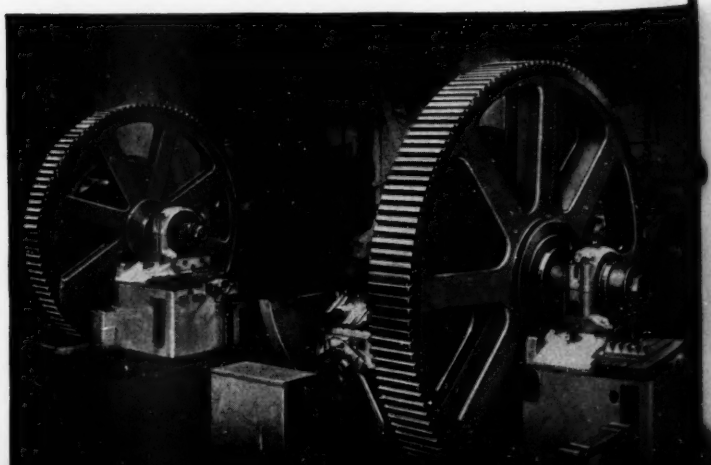

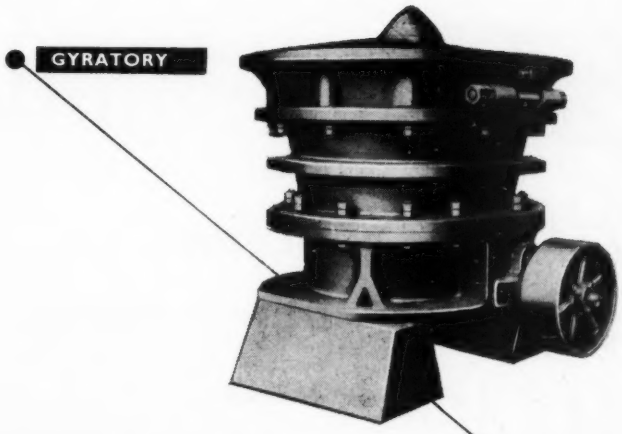

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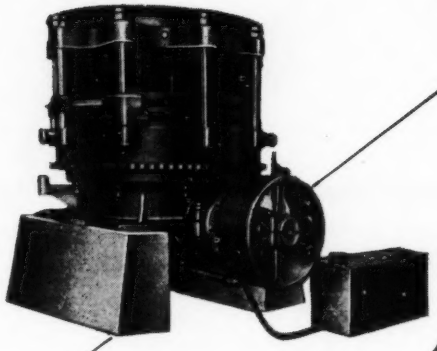

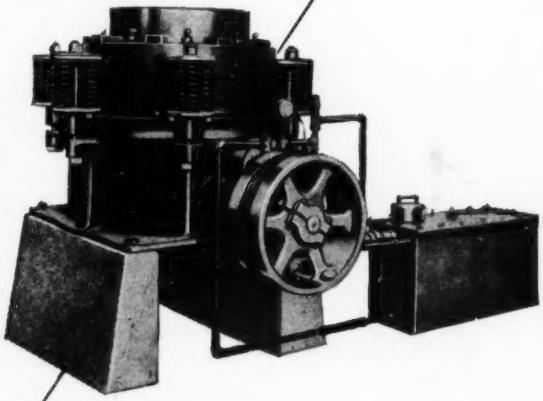

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Holman Group News

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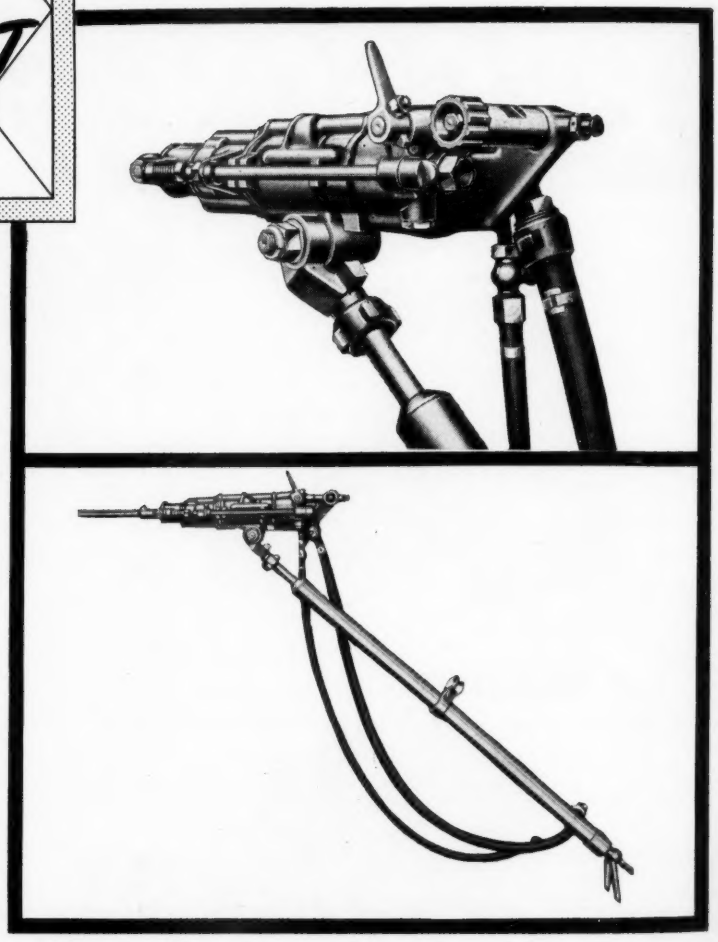

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The Mining Journal

London, September 2, 1960

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The End of Tin Restrictions

THE announcement of the International Tin Council that no permissible export amount would be fixed for the quarter beginning October 1, 1960, heralds the end of nearly three years of restrictions, for it was in the three-months period starting in Mid-December, 1957, that export controls were first put into operation.

The past two years have witnessed a dramatic transformation in tin's statistical position. The darkest hour in the I.T.C.'s history came on September 18, 1958, when the Buffer Stock manager temporarily withdrew from the market and the price of cash tin immediately slumped from £730 to £640 a ton. For the first time in living memory dealings in tin were suspended on the London Metal Exchange. The price quickly recovered, however, at a speed which underlined the inherent strength of the Council's position. Not only were the restrictions becoming effective, but world consumption was starting to recover from the depression which started in the summer of 1957. Once the flood of Russian tin had abated, as the result initially of import controls by some consumer countries and subsequently of an understanding between the Council and the U.S.S.R., the market became very firm and by the end of the year the price was almost £20 above the support level.

Last year, Free World consumption rose to 150,700 l.tons, as compared with 137,000 tons in 1958 and 146,600 tons in 1957. On the other hand, Free World metal production fell last year to 114,000 tons from 123,000 in 1958 and 158,400 in 1957. In line with the improvement in world demand, export quotas were raised in successive stages from 20,000 tons in the first quarter of 1959 to 36,000 tons in the first quarter of 1960.

On the latter basis, which at the time seemed ample to cover requirements, the Free World supply in 1960 was expected to be in the region of 169,000 tons, made up of 144,000 tons from the six producer members of the I.T.A., 11,000 tons for smaller producers, and 14,000 tons exported to non-Communist countries from the Soviet sphere. Against this, the probable Free World consumption was placed at 160,000 tons, indicating a surplus of about 9,000 tons.

From the latest available statistics it now appears that these calculations under-estimated the rise in consumption and placed too high a figure on the probable world supply. Consumption of primary tin in the United States in the month of May, 1960, as reported by the U.S. Bureau of Mines, was higher than at any time since January, 1957, amounting to 5,310 l.tons. Of particular significance is the fact that total U.S. tin stocks (including tin afloat and in process at consumers plants) were down to 36,025 tons on May 31, a decrease of 725 l.tons in one month.

An analysis of consumption of primary tin in the U.S. for the first five months of 1960 shows that it was then running at an annual rate of over 59,000 l.tons, as compared with 45,500 l.tons in 1959 and 48,000 tons in 1958. This increase was reflected in other parts of the world. The latest Statistical Bulletin of the International Tin Council shows world consumption, excluding the U.S.S.R., at 45,200 l.tons for the first quarter of 1960, equivalent to an annual rate of 180,000 l.tons.

There are, of course, certain imponderables on the consumption side of the 1960 picture, notably the disappointing performance of some sectors of the U.S. economy, which are lagging behind earlier expectations. Recent reports suggest that, failing a strong recovery in the fourth quarter, the American tinplate production may fail to reach last year's total, and latterly this situation has been reflected in a less active demand for tin. On the other hand, there is no reason as yet to anticipate that the credit squeeze in the U.K. will have adverse effects on tin demand, while there is no indication of any slackening in the rising tempo of industrial activity in Western Europe.

Despite the upward trend in world consumption, M. Georges Peter, chairman of the I.T.C., ascribes the improvement in tin's statistical position, on which the Council bases its decision to free quotas in the next quarter, mainly to the production situation. He declined to say whether all producing countries had been meeting their quotas in the current quarter, but he agreed that some countries had been dipping into stocks which, in some cases, were " very low ". It is in fact, doubtful whether, outside Malaya, any substantial tonnage of surplus stocks exists. Bolivia has almost certainly been exporting less than her quota, while Indonesia may also be starting to fall behind as a result of the recent expulsion of Chinese mineworkers from the country. It will indeed be recalled that as early as the first quarter of this year quotas were not being met in full by all producer members. In announcing that the export quota for the period starting April 1 would be raised to 37,500 tons, the Council estimated that actual exports would only be about 35,000 tons.

In all these circumstances the decision to abolish quotas is hardly surprising, though it appears to have come rather sooner that was generally expected. The initial market reaction was a fall of £7 10s. in the cash position and £8 for three months' metal. These losses were soon recovered, however, on the reflection that the basic factor in the situation was the stronger statistical position.

There is, of course, nothing to prevent the reimposition of controls when the Council holds its next meeting at Rome on December 5. It is highly improbable, however, that the quotas would have been removed if the I.T.C. were not reasonably confident that any additional supplies coming forward could be absorbed without detriment to the market, if necessary by buffer stock operations.

The lifting of the restrictions has understandably been hailed with enthusiasm by most producer countries, who were called upon to make very heavy sacrifices in the interests of a stable market. During restrictions Malaya, for example, was forced to shut down 300 mines and at one time nearly 1,500 miners were laid off. Obviously the reimposition of restrictions a few months after they had been lifted would be most unfavourably received, to say the least.

At the same time, it is obviously in the interests of the industry, more especially at a time when a new Agreement is awaiting ratification, that the I.T.C. should err, if at all, on the side of over-supply. Nothing could be more surely calculated to antagonize consumers than a squeeze in supplies at a time when restrictions were still in force. With Germany and Japan both giving serious consideration to the possibility of joining the new Agreement, the consequences could be particularly unfortunate. From this aspect alone the ending of controls is perhaps a timely move.

There is certainly no reason to expect that tin's statistical position will be seriously affected by the Council's measure. On the contrary, it would appear that, failing any abrupt reversal of the upward trend in consumption, the I.T.C.'s biggest headache in future years will be to prevent supply from lagging behind demand. This problem would, of course, be aggravated in the event of any prolonged interruption of the Congo supply. In the immediate future minehead stocks, particularly in Malaya, together with the restarting of mines operating on a care and maintenance basis, should be sufficient to meet demand, and in the background there is, of course, the U.S. stockpile as an insurance against any serious shortage in the years ahead.

In the long term, however, tin's future depends on the development of adequate resources to keep pace with demand, bearing in mind that both the U.S.S.R. and Communist China will inevitably be obliged to allocate a growing proportion of their outputs to their own domestic needs. The greatest of all problems facing the industry is not the maintenance of a stable market but the discovery and development of adequate reserves for future years. Perhaps, now that the temporary phase of over-supply appears to have conclusively ended, this most essential of all requirements will be accorded the attention it deserves.

HIGHER WAGES FOR COPPERBELT WORKERS

After six weeks of negotiations, agreement has been reached between the mining groups, represented by the Chamber of Mines, and the African Mineworkers' Union for wage increases affecting some 40,000 Africans employed in the Northern Rhodesian copper mines. The agreement provides for an all-round increase of 15s. a month in basic pay, effective from August 3, and consolidation of the present 15s. monthly cost-of-living allowance into basic pay. The consolidated allowance, plus the 15s. increase, will both count for the calculation of metal bonuses, overtime, payments, long service and retirement bonuses.

Under the new agreement the minimum starting pay for a Group 1 surface worker rises from £10 12s. 6d. to £12 2s. 6d. per 26-shift month. For a senior underground worker with two years' experience the basic wage is increased from £19 12s. 6d. to £21 2s. 6d.

The new agreement replaces one negotiated in November, 1958, which expired on June 30, and ends in December, 1961. An essential part of it is that there must be no change in wages until that date.

AUSTRALIAN GOLD MINES HIT BY RISING COSTS

Australian gold mining companies are having a hard struggle to maintain profitable operations. While the price for gold remains unaltered, costs, influenced primarily by continually rising wages in all industries as well as the mining industry, are steadily increasing, and recently at a steep rate. The profit margin is becoming narrower, and companies on, or near, the border-line will inevitably have to close down, if the trend continues, or if higher grade ore cannot be located and worked.

There has been no satisfactory compensating factor to the steady rise in costs. Government assistance has helped to some extent, but has been limited in amount, and it is considered that a price for gold less than £A20 per oz. will be of small

assistance to the industry. The big companies have done much in mechanization, and in increased efficiencies, but these directions have their inevitable limits, and what is gained thereby is quickly lost. The large companies are less seriously hit than their smaller companions, and some are now spreading their interests to fields other than gold; some are turning into investment-type organizations. Reports for most companies show decreasing ore reserves, and Government financial support for the maintenance or increase of ore reserves is a direction in which assistance is well merited. On continuance of a steady rate of development, or its expansion, the future of this very important industry rests.

SCOPE FOR MINERAL DEVELOPMENT IN AUSTRALIA

Mr. G. R. Fisher, of Mount Isa Mines, has stressed the need of preparedness to take advantage of increasing demand, and the need for greater expansion of Australia's known mineral deposits and for the discovery of new mineral occurrences, and for this a positive plan of action is imperative. The most likely region for new discoveries is in the little known northern and western parts of the country. A large proportion of favourable rock in this region has sand and duricrust cover; this feature, together with the remoteness and hard natural conditions will make modern prospecting difficult. For the prospecting of this area sealed access roads are necessary for utility purposes. In the past bitumen roads have been constructed in the Northern Territory from Alice Springs to Darwin and from Tennant Creek to Mount Isa; these have improved transport very greatly.

The Northern Territory is following this lead, and a number of gravel roads has been built to mines and mineral districts of some promise. All-weather roads are essential for the maintenance of transport, for in the wet season, of some three or four months duration, earth roads are either impassable or offer great difficulties. Sound means of transport are the primary factor in inducing the prospector to go out into the mineral country, and to stay there.

THE KURSK MAGNETIC ANOMALY

Soviet geologists believe that in the area of the Kursk magnetic anomaly there are 30,000,000,000 tons of rich iron ore. Together with the poorer iron ores, the deposits contain some 200,000,000,000 tons. This ore is contained in an area about 435 miles long and 125 miles wide. These figures were given at a Press conference held recently in Moscow.

Pyotr Antropov, U.S.S.R. Minister of Geology and the Conservation of Mineral Wealth, said that the Kursk magnetic anomaly was the biggest of the Soviet Union's iron ore deposits, which now account for some 40 per cent of the world's known resources. The Kursk magnetic anomaly lies close to the Donets coal basin, which opens up broad prospects for the development of the iron and steel industry in the area, he stated.

Soviet geologists have found so-called iron magnetites with an iron content of 56-69 per cent in the area of the anomaly at a depth of 1,300 to 1,600 feet, lying in seams 230 to 350 metres thick. Until 1953, it was believed that the bulk of the anomaly consisted of iron quartzites with an iron content of 33 to 37 per cent.

Turning to the prospects for the development of the area during the present Seven-Year Plan (1959-65), the Minister said that by 1965 its mines would be producing 36,000,000 tons of high-quality iron ore, mainly by the opencast method. For this reason its cost would be comparatively low. At present ore is being extracted at several places, including the Mikhailovsky mine, the resources of which are estimated at 500,000,000 tons. Antropov stressed that the Kursk magnetic anomaly would shortly become the principal iron ore producer of the U.S.S.R.

"The prospects for its development are unlimited," he declared. "By 1980 it will already be producing 60,000,000 tons of iron ore, that is to say, as much as is now being extracted at all mines in the United States.

In conclusion, he pointed out that at the present time 42 per cent of the entire territory of the U.S.S.R. had been covered by geological prospecting. With the prospecting of the remaining part—the greater part of the country—new and brilliant prospects, he said, would be opening up.

EASTERN NIGERIA'S MINING PROSPECTS

Eastern Nigeria is a region rich in minerals, according to a team of economic experts from the Ford Foundation of America now surveying the region's resources.

Mr. Faaland, Norwegian leader of the three-man team, has stated that, from what the team had seen and read, the Eastern Nigerian Government could launch its proposed industrial and agricultural programme by 1962. He hoped the programme would include mining of iron ore, and limestone, both of which are found in large quantities in the region.

The lead and zinc mine at Nyeba in Abaliki Division, in the northern part of the region, might resume production next November if the required capital of £1,000,000 could be found, the Eastern Nigerian Minister of Information, Mr. B. C. Okwu, has been told by the manager, Mr. J. Hill, who said that operations had been suspended since 1956 owing to lack of funds and the drop in the world market. The Eastern Nigerian Government has already set aside £50,000 for development of the mine.

INDIAN COPPER MINING PLANS

India's programme of development of copper to meet her growing requirements was outlined at New Delhi, by the Minister of Steel, Mines and Fuel, Sardar Swaran Singh. He said the places where the government intended to concentrate its activity during the Third Plan period included Khetri and Daribo in Rajasthan, Bhotang and Pachekani in Sikkim and Gani in Andhra Pradesh.

Consumption of copper in India has almost doubled during the last five years. It is likely to be of the order of 66,000 tons by 1961 and of the order of 80,000 tons per annum, on average, during the Third Plan period. The only production in India has been from Ghatasila in Bihar of 8,000 tons annually of fire refined copper, while the major requirement of the country is electrolytic copper. Annual imports at present are valued at 135,000,000 rupees and are expected to exceed 200,000,000 rupees during the Third Plan.

In Khetri the reserves proved so far are considered sufficient to support production of metal at a minimum rate of 10,000 tons per annum of electrolytic copper. The Daribo deposits of copper in the Alwar district of Rajasthan have been intensively explored. The ore has an indicated average of 2 per cent metal and can readily be concentrated. It is considered necessary to commence operations at a minimum rate of 200 tons of ore per day.

A corporation, called the Sikkim Mining Corporation having an authorized capital of 10,000,000 rupees, with the Sikkim darbar holding 51 per cent of the shares and the Government of India 49 per cent, has been set up to exploit the copper reserves in Sikkim state.

Our First 125 Years

ONE hundred and twenty five years have elapsed since the birth of *The Mining Journal* and the publication of our first issue on August 29, 1835. It came at a time when Western civilization was on the threshold of new and exciting developments — technical, political and economical—which were to transform the pattern of living throughout the globe.

One of the oldest trade and technical publications in Britain and, in fact, the world, *The Mining Journal* was a product of the new and increasingly complex conditions and problems generated by the Industrial Revolution from which arose the need for specialized publications providing a continuous flow of authoritative news and commentary on developments in specific industries or trades.

From the Iron Age to the Atomic Age

When *Mining Journal* was born the Iron Age had barely begun. By the time it had reached its fiftieth birthday the Steel Age was in full swing. Within still recent memory new horizons have been opened to industry by additions of metals which impart to steel a wide range of new properties undreamt of when Bessemer discovered the famous process that bears his name. Today the iron and steel industry is facing a growing challenge from aluminium and the world has moved forward into the Atomic Age, in which the search for materials capable of meeting the exacting requirements of aircraft designers, nuclear power generation, electronic and guided missiles, has led to the commercial production of virtually every metal in the atomic scale. By the time we celebrate our 150th birthday, the world may well have entered the new era of Space Travel, whose threshold is already being explored.

Yet " plus ça change, plus c'est las même chose." Despite growing competition from plastics, civilization remains no less dependent on mining, not only for its technical advances but indeed for its very existence, than in 1835. To quote from the leading article introducing the first issue of *The Mining Journal :*

> " Mining is not only a subject of interest to the man of science, but to the capitalist and to the trader. In its operations science must necessarily be consulted; and, immediately connected with geology and mineralogy, it constantly affords matter for reflection, leading the mind as it eminently does to subjects on which to exercise its energies, and render them productive of general benefit... To Mining is the trader of every class, from the merchant and humble shopkeeper, indebted; for coal, iron, etc., as not only applicable to Mining speculations, but as including also the necessaries of life."

Substitute for coal and iron the broader designation of fuel minerals and metals, and these words are as true as ever at the present day.

Just as mining remains basic to all other industry—even including agriculture — so, too, has our editorial policy continued to be governed by the principles which were laid down in our first issue and implicit in the title chosen.

> " As a ' Mining Journal '," continues our first leader, " all appeared to be embodied in that designation. Our Mines, as affording employment of capital, as giving subsistence to our peasantry, in the extraction of the ores, and in bringing them into a state of reduction; as embodying in its operations the consideration of the sciences—Geology, first leading the miner to the strata in which he may expect to find ore, then guiding him to his operations on sudden transitions or changes— Mineralogy, teaching how to discover the existence of the metallic properties of the lode, the various combinations which are met with, their importance and value. To chemistry, as the handmaid of science, in carrying into effect the results of mining operations, are we more particularly indebted. It would appear that the title of the Mining Journal is sufficiently comprehensive to embrace them all; and, we need hardly add mechanics."

If, to these, we add such new sciences as geophysics and geochemistry together with the revolution brought about in the industry by the developments of mechanization and automatic processes, these words are an accurate definition of the field covered by our news and technical sections at the present day.

Our rôle in the field of mining finance was stated in the first issue in the following words, which could scarcely be faulted :

> " To the various Companies, where capitalists are united, a paper of this kind would appear to us almost indispensable, forming a nucleus of communication on all points of importance to the monied interest."

Early Emphasis on the Economics of Mining

In these circumstances it is scarcely surprising that the need for economy—such an intrinsic feature of mining operations at the present day—should have been given considerable emphasis in our maiden issue. In fact, it would appear that no little progress had already been made in this direction, for it was estimated that mining costs in Cornwall had decreased by something like 40 per cent in 25 years.

> " Mines in the county of Cornwall," reports our first issue, " abandoned half a century since, have lately been resumed, and are now working with advantage, while ruin must have attended the original proprietors without the advantage of scientific assistance. The unfolded powers of the steam engine, and the improvements of Watt and other engineers of the present day, have contributed largely to the encouragement of mining operations ".

M.J.'s World-Wide Circulation Grew with Spread of Modern Mining

Although its birth coincided with what appeared to be a revival of British metal mining, *The Mining Journal* was destined to witness the virtual demise of this historic industry due principally to growing competition from new sources overseas, where ores were being worked more cheaply and on a larger scale. By the latter part of the 19th century the industry had already dwindled to a shadow of its former self. Its death knell was sounded by the exceptionally low metal prices ruling in the last decade of the Victorian era.

These changes in the geographical distribution of metal

mining, which have radically altered the pattern and structure of the metal trades, are reflected in the expansion of our own overseas mining industry, as well as in the unique position currently occupied by *The Mining Journal* as the only international weekly in the world devoted to mining and its related activities. Mirrored in our columns are developments of economic or technical interest in all parts of the mining world and our readers are drawn from more than eighty countries.

Though the character and policy of the journal have remained unaltered during 125 years of continuous publication, changing tastes and requirements, together with technical progress in the printing and presentation of periodical publications, must inevitably leave their mark on any publication which seeks to keep abreast of the times. In both appearance and content our 19th century issues, like the steam engines of the famous Cornish mines, belong to an era which already seems strangely remote.

What Of the Future?

What, one wonders, will be the position of the mining industry in 2085 when we celebrate our 250th birthday? No good purpose would be served by indulging in fascinating but profitless speculation as to future possibilities such as the use of atomic explosions underground or the extraction of minerals from the ocean's bed. It can safely be predicted, however, that the world's appetite for metals will keep pace with rising population and living standards and that progress in extraction and beneficiation techniques will continue to push back the frontiers of payability, opening up vast new tonnages to profitable exploitation. As the mining industry increases in scope and magnitude and its operations become ever more complex, so, too, will its administrators and technologists be faced with an ever more formidable task in keeping themselves informed of all the far-flung developments of potential significance to their work.

To serve as a vehicle for the dissemination of news and expression of opinion has always been the prime objective of *The Mining Journal*, as emerges clearly from the editorial policy enunciated in our first issue. We are confident that the next 125 years will bring even greater opportunities to serve the industry, its suppliers and customers, in accordance with the broad objectives so wisely laid down by our founder and first editor 125 years ago.

Australia's National Mapping Project

A PLAN for the systematic mapping of Australia and New Guinea in a way which will meet both civil and defence requirements has recently been evolved.

The plan, which has been adopted on the recommendation of the Advisory Committee on Commonwealth Mapping, will be carried out jointly by the Division of National Mapping of the Department of National Development, and the Royal Australian Army Survey Corps. The immediate objective is to complete the topographic mapping of Australia and New Guinea at a scale of 1 : 250,000—that is, approximately four miles to the inch. There is general recognition that this is the appropriate scale for first coverage of a large country, and the States, through the Surveyors-General, have requested the Commonwealth to concentrate upon the production of maps at that scale.

The programme will be based essentially upon air photographs. By the end of 1963 the air photography of Australia, which was begun about 1935, is expected to have been very nearly completed. However, some of the air photograph coverage carried out during the war will need to be replaced by new photographs. Air photography will also continue in New Guinea.

Some of the latest available mechanical aids will be enlisted in carrying out the project. Airborne electronic measuring equipment to cost about £16,000 will be purchased by the Division of National Mapping, and the Department of the Army will be equipped with a radar profile recorder at similar cost.

The equipment will be operated from charter aircraft by a joint Army and National Mapping survey team.

Assistance on the whole mapping project will be obtained by contracting some of the mapping to private enterprise.

Working on air photographs, the geographic position of map features will be determined by a combination of ground and photogrammetric surveys. By ground surveys the position of a number of marked control stations will be determined. Air flights will then be made over the area with aircraft carrying the electronic equipment which will be used to fix the position of key photographic points relative to the control stations.

The radar profile recorder will give lines of heights above sea level over the area to be mapped. Then by a process of measurement with the aid of the photographs the location of all topographical details required for the map will be positioned and plotted.

In order to get the maps produced as quickly as practicable the first edition will not be contoured ; differences in level will be shown by a shadow pattern. Information required to produce contoured maps will be " stockpiled " for later use in a contoured edition.

The mapping of Australia and New Guinea is a task of considerable magnitude. If the Army Survey Corps and the Division of National Mapping achieve their objective of producing 30 maps each year, it will take nine years to complete the project now being undertaken. This does not mean, of course, that large parts of Australia are unmapped and will remain so for nine years. Maps of one kind or another are available of much of Australia and maps at virtually any scale can be, and are produced, at short notice to meet priority requirements, for example, maps required by oil exploration companies.

Other mapping will be continued by both Commonwealth agencies, but they will concentrate their efforts to the greatest extent practicable on the four-mile map programme. Detailed mapping by the State Surveyors-General will, of course, continue.

Up to the present the Department of the Army and the Division of National Mapping have been engaged on meeting urgent requests of individual Departments for specific informational maps. These requests have now been substantially met, so the Division of National Mapping and the Army Survey Corps are thus free to embark upon a systematic and integrated mapping programme for Australia and New Guinea. However, within this programme the order of priority will be determined by the requirements of individual Departments and agencies, such as the Commonwealth Scientific and Industrial Research Organization, the Bureau of Mineral Resources, Army, Civil Aviation and Supply.

Yugoslavia's Lead and Zinc Industry

THE territory which Yugoslavia covers today was known as being very rich in lead and zinc even in the distant past. This wealth derived from large deposits of lead and zinc ore, which allowed its exploitation even in the earliest periods and with primitive methods.

The importance of the lead and zinc ore mining resources of Yugoslavia lies in the fact that, in addition to lead and zinc as its basic metals, the ore also contains considerable quantities of silver, gold, bismuth, cadmium and other metals.

Thanks to this natural wealth, the production of zinc and, more especially, of lead, in Yugoslavia has attained a very high level. Thus, Yugoslavia already takes first place in Europe in the production of primary lead. Zinc production, however, has not developed to the extent that the production of ore and zinc concentrate makes possible. In the last few years, serious efforts have been made to bring the production of zinc into line with the production of zinc concentrate, namely to make possible the processing of the entire output of concentrate into zinc metal in the country.

The exploitation of lead and zinc in Yugoslavia is below the world average. For example, Yugloslav mineral resources make up 6.6 per cent of the world's total resources in the case of lead, and 2.3 per cent in the case of zinc. But Yugoslavia's participation in total world production is about 3 to 3.2 per cent in the case of lead and 1.2 per cent in the case of zinc. The need for more intensive exploitation of lead and zinc and for increasing the production of lead and zinc metal is, therefore, of great importance. Yugoslav experts have already drafted a plan for increasing the production of these metals, as well as for the construction of plants for their further processing and manufacture into finished products.

An Increase in Production?

Having in mind these possibilities and the lively interest of Yugoslav traders, it is realistic to expect that there will be an increase in production, domestic consumption and exports of lead and zinc production in the near future. There will be a particularly substantial increase in the production of zinc, which requires only the construction of smelting capacities and not the opening or expansion of mines and refinery capacities.

In the pre-war period and during some post-war years, lead and zinc production was as follows (in tonnes):

Year	*Refined lead*	*Crude zinc*	*Electro zinc*	*Total zinc*
1939 ..	10,651	4,918		4,918
1946 ..	32,591	3,294		3,294
1950 ..	57,204	12,315		12,315
1956 ..	76,284	13,809	7,181	20,990
1959 ..	85,395	18,095	13,659	31,754
1960 *(planned)*	87,000	18,000	14,500	32,500

This abstract is taken from one of a series of articles on Yugoslav products, published by the Yugoslav "Commercial News"

Lead and zinc metal production in Yugoslavia is at present carried on by four enterprises: The Trepca Mines and Lead and Zinc Smelting Works at Zvecane; the Lead Mines and Smelting Works at Mezice, where lead is produced; Cinkarna, Celje, and the Zorka chemical plant at Sabac, where zinc is refined; crude and refined zinc at Cinkarna and electrolytic zinc at the Sabac factory.

Exports and Domestic Consumption

Lead and zinc metal exports in the past few years were as shown in the following table (in tonnes):

Year	*Refined lead*	*Crude and refined zinc*	*Electro-lytic zinc*	*Total zinc*
1956 ..	59,700	2,285	2,847	5,132
1959 ..	63,300	2,257	8,845	11,102
1960 *(planned)*	62,000	1,000	7,500	8,500

As can be seen, despite increased production, the export of lead and zinc metal has not increased in the last couple of years, but is more or less stationary, in the case of lead, while so far as zinc is concerned it is on the decline. The reason for this is a substantial increase in the consumption of these metals in Yugoslavia during the last few years, due to domestic industrial development.

The U.S. is the biggest consumer of Yugoslav lead and zinc, accounting for 45-50 per cent of Yuogslav lead exports and about 60 per cent of her zinc exports. Besides the U.S., Yugoslav lead and zinc is exported to the Federal Republic of Germany, Switzerland, Italy, Great Britain, Netherlands, Austria, France, Denmark, the U.S.S.R., Poland, India, Egypt, Chile, Uruguay and other countries.

Thanks to her increased domestic consumption of lead and zinc, Yugoslavia is increasingly becoming a producer and exporter of all types of lead covered cables, semi-finished lead products and products based on zinc such as various kinds of brass (copper-zinc alloy) and semi-finished products based on pure zinc and brass, as well as products of other branches in which zinc is used as a raw material.

Semi-finished lead products are marketed in Turkey and Greece, and also in countries in the Near East, including Egypt, Iraq, Iran and the Lebanon. Rolled zinc products are exported to the following markets: Denmark, Federal Germany, Turkey, U.S.A., Egypt, Greece, Syria, Uruguay and other countries. In general, 90 per cent of the zinc sheet exports go to European countries, about 7 per cent goes to the U.S.A., while the remaining 3 per cent is shipped to other destinations.

Dust Control in Mines of British Columbia

The following article, condensed from "The Canadian Mining and Metallurgical Journal", was presented as a paper at the Canadian Institute of Mining and Metallurgy Annual Western Meeting by D. A. MacLeod, chief inspector, Silicosis Control Department, Workmen's Compensation Board, Vancouver

THE dust control programme in British Columbia follows the principle of reducing the concentrations of all dusts, thereby reducing the amount of silica dust or asbestos fibres in the atmosphere. Various factors enter into the selection of an instrument or instruments which are to be used for sampling airborne dust. For research work, precision instruments such as the thermal precipitator are necessary, but for routine dust sampling they are slow and complicated.

As there was a serious silicosis hazard in the metalliferous mining industry when this work was started, and as experience in other countries had shown that proper dust control could greatly reduce the incidence of the disease, it was decided to use a dust sampling instrument which would give quick and fairly accurate results. Two of the instruments which have been very sucessful for routine work are the konimeter and the impinger.

The konimeter originated in South Africa after years of research work to obtain a satisfactory instrument for routine dust sampling, and it is used there to the present time. With some modification in the treatment of the dust spots before counting, this instrument was adopted in Ontario and later in British Columbia. It has been instrumental in indicating a substantial reduction in the air dustiness of the mine atmospheres, with the resulting protection to the health of the workmen.

When asbestos mining operations were started in British Columbia during 1952, the midget impinger was selected for sampling the atmosphere where asbestos fibres may be present. This instrument is more suitable for collecting the fibres over 10 microns in length which cause asbestosis. Its use was standardized in Quebec, where the greatest amount of asbestos in the world is mined.

The konimeter is used as a standard instrument for all rock dust work with the exception of absetos dust, where the impinger is employed.

Dust Sampling

The circular konimeter is used in taking dust samples in most mines and industrial plants and in rock tunnels. Three types are used—the Devers, Gathercole, and Zeiss. The basic construction of these instruments and the manner in which dust samples are taken are practically the same. To assure that each instrument gives similar results, they are occasionally checked against each other by taking dust samples simultaneously from the same atmosphere and comparing the dust concentrations obtained. The results have been checked very closely, so that all the instruments can be relied on to give satisfactory performances.

Good quality glass slides that will withstand an approximate temperature of 1,000 deg. F. are used. After thoroughly cleaning with alcohol, a thin film of refined mineral oil is evenly spread over the sampling surface with a piece of clean absorbent cotton and the slide is then placed in the konimeter, ready to be used. After the dust samples are taken, the slide is removed from the konimeter and placed in a small electric furnace.

The mineral oil is burned off and, after the slide has been allowed to cool, a solution of 5N.C.P. hydrochloric acid is spread over the dust spots for about two minutes and then thoroughly washed off with alcohol. The slide is then replaced in the furnace so that any alcohol which may adhere to it is burned off. After cooling, it is placed on the microscope stage and the dust spots are counted.

The microscope is arranged to give a magnification of 150 diameters. A "light" stop is used below the condenser so that the dust appears as bright specks against a dark field. Illumination is supplied by a 100 watt, frosted light bulb. Counts are expressed as particles per cubic centimetre of air.

The impinger method of dust sampling consists of the collection of dust in a liquid medium and using a microscope to count the particles in a known portion of this liquid. The midget impinger used in British Columbia is similar to that used by the U.S. Bureau of Mines.

The dust collecting device is known as the impinger flask. It is about 11 cm. long and 2.5 cm. in diameter. The air containing the dust is drawn through the impinger tube, which has an orifice of 1 mm. diameter, and is impinged upon a smooth surface under the bubbling column of liquid. The dust is collected by the liquid from the smooth impinging surface and from the bubbles of air as it passes through the liquid.

A hand operated pump is used to draw the air through the impinger and is calibrated to pass a volume of 0.1 cu. ft. of air per min. The dust sample is taken over a period over 10 mins., so that approximately 1 cu. ft. of air is sampled.

A solution of one part isopropyl alcohol and three parts distilled water is used as the collecting medium, using a volume of 10 ml. for each sample.

A Spencer microscope, having a 10-X objective and 10-X eyepiece, is used. Illumination is light field using a 10-watt substage lamp.

A known volume of the liquid containing the dust is placed in a counting cell and the dust counted. The count is expressed as millions of particles per cu. ft. of air sampled.

The gravimetric method of dust sampling consists of drawing a known volume of air through a suitable filter medium and determining the amount of dust collected by weighing. This type of dust collection has not been used by the organizations as a routine procedure in the determination of dust concentrations.

The use of filter cloth or filter paper for collecting dust has been confined to obtaining a sample sufficiently large for chemical or X-ray diffraction analysis, particularly for free silica analysis. Various types of filtering equipment have been used but one of the problems encountered was the difficulty of collecting a sufficiently large sample in a reasonably short period of time.

Since the breathing of dust is the primary cause of the pneumoconioses, the diseases can be prevented by the complete elimination of dust in the atmosphere but, unfortunately, mining, crushing, and industrial operations cannot be carried on without the production and dispersal of some dust into the surrounding air. Dust samples are taken throughout the operation.

Dust sampling is not pursued as an end in itself but as a means toward the lowering of the dust concentrations to which the workmen are subjected and as an assessment of the potential health hazard. The efforts are directed toward the goal of reducing the concentrations in working locations to the lowest possible limit under practical working conditions.

Inspection and Control

The following dust control measures are possibly the more important ones and only some of the salient features of each are discussed.

Underground Ventilation: Ventilation, whether by natural or mechanical means, is undoubtedly one of the most effective means of controlling the dust concentration and of removing it from the mine atmosphere. It should, therefore, be given the most serious attention as a measure to prevent silicosis, asbestosis, etc. But care must be taken not to put too much of a dust burden on ventilation.

Other measures of dust control should be strictly applied, so that too much dust is not dispersed into the atmosphere. Good ventilation does its best work when other precautionary measures are put to good use.

Natural ventilation may be very effective when several horizontal entries from the surface can be made to the mine at different elevations and having connections between levels through the orebody. Most of the metalliferous mines of British Columbia are fortunate in that the topography of the country is conducive to this condition and a large number of the smaller ones rely on this type of ventilation.

More mines are now using mechanically controlled ventilation than in former years. Ventilation in coal mines is strictly controlled by mechanical means. The main purpose of such control is not for the prevention of disease but for the prevention of an explosive mixture of dust and air or of gas and air.

During 1952 and later years, a large number of tunnels through rock have been driven. For these, ventilation by means of fans and pipe is necessary. In most instances where canvas or rubberized tubing had been used in fairly short tunnels, unsatisfactory results were obtained. Leakage of the air through holes and tears caused by blasting operations decreased the amount of air that was to be delivered to the working face. It has been found that a single high pressure fan placed near the portal and blowing air through metal pipe with well sealed joints to within 60 to 80 ft. of the face gave the best overall practical performance.

Wetting Broken Rock: One of the most important measures in controlling the amount of dust dispersed into the atmosphere is the wetting of broken rock before it is handled in any manner.

Water blasts on atomizers at blasting locations are recommended to wet walls and backs of the locations and the top surface of the blasted rock as well as to remove some of the larger dust particles and noxious gases. The preliminary wetting prevents dust from being dispersed by air currents and by workmen when they re-enter the location. Subsequently, the broken rock should be wetted.

Wet drilling is the practice in underground operations of the metalliferous mining industry. Very few exceptions to this rule are allowed by the inspectors of the Department of Mines.

Blasting Operations: Primary blasting of rock in development drifts, cross-cuts, raises, shaft, and stopes produces the densest concentrations of dust underground. It is considered to be extremely dangerous as a pneumoconiosis hazard owing to the density of the concentration and to the presence of noxious gases produced from the explosives.

Under present working conditions, these operations are generally performed at the end of the working shift, with several hours allowed for the ventilation currents to remove the dust and gases from the mine. Large blasting operations in stopes are often done at the end of the working week so that there is an even longer period for the removal of dust and smoke. Good ventilation is the answer to the problem.

Secondary blasting of rocks which are too large to pass through chutes, grizzlies, and other small openings is generally done during the working shift. These operations produce dust but not to the same extent as primary blasting operations. Good ventilation to dilute the dust concentration and carry it from the mine is the best solution.

Crushing and Drilling

Exhaust Systems: Crushing plants and assay grinding rooms require good exhaust systems to keep the dust concentrations at a reasonably low figure.

The rock handled in assay grinding rooms is generally in a dry condition. Without an exhaust system in the plant the dust concentrations are very dense. The exhaust system should be well planned so that an indraft is always maintained at each of the crushing, dividing pulverizing, rolling, sacking, and mixing operations. Even with a good exhaust system installed, an operator can cause very unsatisfactory dust conditions by the indiscriminate use of compressed air in cleaning out the units after each run of sample.

All crushing plants should have exhaust systems. There may be certain conditions, as during the time when wet small sized rock is being crushed in a small plant, when the dust counts are not high. But this ideal condition is not found very often and all plants will at times be crushing coarse rock and dispersing more dust into the atmosphere. When larger crushers are used or when additional crushers and screens are used, the production of dust is increased. This flow of dust-laden air should be exhausted from hoods placed at the discharge ends of each unit. These are the more important locations to be watched but there are others from which it may be necessary to exhaust the air.

Drilling: Percussion drilling operations produce the most hazardous dust concentrations during the working of a shift. Primary blasting operations will produce denser concentrations but the workmen are either not subjected to them or are exposed to them for short periods only. At drilling operations, the workmen are subjected to the dust throughout the drilling period, particularly in development headings.

Stopers produce denser dust concentrations than do leyner drills. The stopers are used mostly in drilling vertical or near vertical holes in raises and stopes. It is difficult to maintain a water seal in the hole as the water runs out more easily than from a horizontal hole and compressed air is blown to prevent the rock sludge from

entering the drill machine. These conditions tend to disperse more dust into the atmosphere than is dispersed by leyners, used primarily for drilling horizontal holes.

For the elimination of dust in the operation of these machines it is most important to maintain a good flow of water down the drill steel to the bottom of the hole and prevent air from passing down the steel with the water. Needless to say the collaring of the hole should be done slowly, with a full flow of water through the steel. Otherwise, so much dust is produced by this portion of the operation that the good work done by the other preventive measures is cancelled.

Most surface drilling operations are done dry, and quite dense concentrations of dust are produced. Very frequently there is a breeze which carries most of the dust away from the operator. An exhaust system using an ejector to draw the dust from the collar of the hole and discharge it down wind from the operator gives better results.

General Considerations

The following final considerations are of interest :

(a) If either free silica or asbestos fibres are present in the airborne dust of a working location, it is considered a potential hazard to the workmen's health and dust control measures are advocated. As either of these two dusts are mixed with other dusts in the atmosphere, the procedure is to reduce the total amount of the dust, thereby reducing the amount of the harmful portion.

(b) In an effort to determine the free-silica content, dust samples have been taken in mining operations, industrial plants, and other operations. They have been collected mainly by means of filter paper and filter cloth but also by collecting dust which has settled on beams, ledges, etc. Their silica content has been determined by chemical and X-ray diffraction methods. The results obtained give only a general indication of the free-silica hazard which is present in the dust that the men breathe.

Where such sampling has been done in underground operations, the silica content of the dust has varied widely. The present conception is that it is the total surface area of the dust, and not necessarily its mass, that gives the real measure of the harmfulness of silica dust. It is evident that much research work remains to be done on this subject.

(c) The dust sampling programme in the coal mines of British Columbia has followed along similar lines to that in the metalliferous mines. The work done in Great Britain would indicate that the U.K. coal miners are not wholly satisfied with such dust sampling procedure as has proved so successful in metal mining operations. It is generally considered that a heavy coal dust burden is harmful just as is any silica or other rock dust which may be present in the coal.

(d) When full dust control measures have been applied at a metal mine, the McIntyre Research Foundation permits the use of aluminium powder as a prophylactic for the prevention of silicosis. Provision of the necessary facilities is voluntary on the part of the mines.

The Workmen's Compensation Board has provided facilities for aluminium powder therapy treatments at its Rehabilitation Clinic in Vancouver to workmen who have some impairment from silicosis and who no longer reside in mining areas where they can get the treatment. It is voluntary on the part of the workmen and the treatment is strictly controlled by the Medical Referee for Silicosis.

MINERAL PROCESSING IN MOROCCO

FOLLOWING the trend in newly independent countries, Morocco is to reduce exports of raw materials and process them in new home industries before selling them abroad. This policy is to be applied particularly to the mining industry and the new Five-Year Plan (1960-64) being formulated last month, contains some general information about plans for " ore transformation industries " which are expected to go into production within the next five years.

Most important of these will be the chemical industry to be established at Safi, the port through which much of Morocco's phosphates is exported from the Kachkate (formerly Louis Gentil) mines, and which is close to a deposit of natural gas recently discovered near Essaouira (formerly Mogador) which will be used to supply the necessary power.

According to the Minister of National Economy, M'Hammed Douiri, the Safi chemical industry will produce 200,000 tonnes a year of super-triple phosphates, 400,000 tonnes of sulphuric and 150,000 tonnes of phosphoric acids, 25,000 tonnes of ammonia and between 100,000 and 110,000 tonnes of ammonium phosphate.

Total investment is expected to be in the region of 18,000,000 francs, of which 7,000 to 8,000 million will be invested in a first phase by a Moroccan-Dutch company in which Royal Dutch Shell will hold 55 per cent and the Moroccan Government 45 per cent through its Bureau d'Etudes et de Participations Industrielles (BEPI); this first phase provides for the construction of the ammonia and ammonium phosphate plants.

Apart from phosphates, total production of which will be raised to 10,000,000 tonnes a year by 1965, no special efforts will be made under the Five-Year Plan to increase output of minerals.

Second in importance is the government's plan to create a steel industry in N.E. Morocco at Ras Kebdana, near the Moulouya river estuary, to employ raw materials from the Melilla iron mines, the Djerada anthracite mines and the Bou Arfa manganese mine. This project, part of a general plan to develop N.E. Morocco, will entail the construction of a new port at Ras Kebdana and railway lines from Oujda and Melilla.

Mr. Douiri said 165,000 tonnes of steel and 20,000 tonnes of ferromanganese could be produced in the first phase, or considerably less than was claimed several months ago by the previous government. In the month of July, four experts from Koppers, including the American vice-president of the group, Mr. Fred Denig, visited Rabat to discuss this project with the Moroccan authorities. No commitments were made and the project is still very much in the preliminary stage.

The Five-Year Plan council will form commissions to examine other possibilities as follows: the enrichment of zinc ore near Zellidja's Toussit and Bou Beker mines, N.E. Morocco; a lead smelter to treat ore from a number of small mines in the Tafilalet province (East Morocco); and the transformation of antimony, cobalt, copper and nickel ores.

The guiding principle behind all these projects is to employ the maximum amount of labour compatible with foreign and domestic market conditions, according to Mr. Douiri. Wherever possible, manual labour will be employed in construction and, in certain cases, additional costs of up to 30 per cent will be allowed to make possible the use of elbow grease instead of machinery.

Mr. Douiri said a grand total of 850,000,000,000 francs would be invested by the State and private enterprise during the five years, 400,000 new jobs would be created, the gross national product would be increased by 5 per cent, while the import of capital equipment would increase the country's trade deficit.

Machinery and Equipment

Latest Pump Models

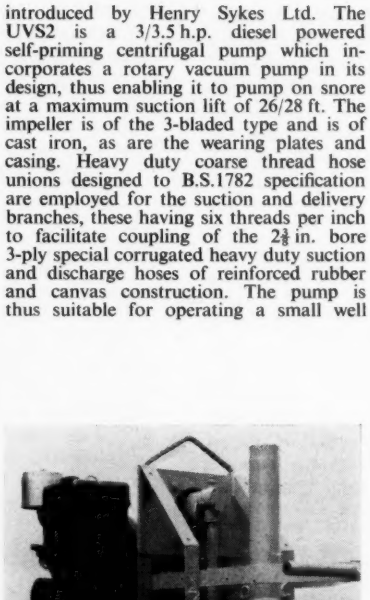
Several new pumps with applications in the mining industry have recently been put on the market by British manufacturers.

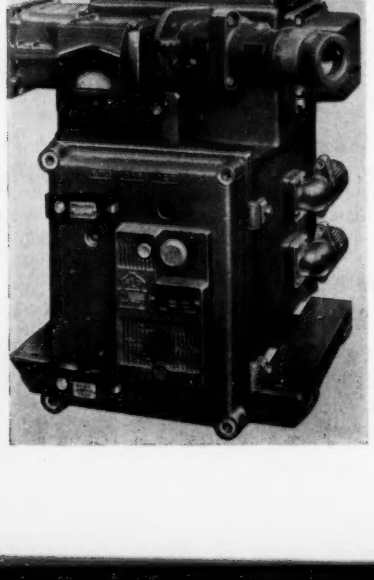
C. H. Johnson (Machinery) Ltd. announce the introduction of their Mk 4 mud pump embodying many notable advances in design, giving a maximum output of 3,600 g.p.h. and heads up to 80 ft. This new pump is compact yet robust. A new type of gearbox mounting has been developed, whereby the gearbox is flange mounted to a steel plate member above the pump chamber instead of being foot mounted as previously. This is claimed to have strengthened the mounting, and at the same time the stroke of the pump has been reduced in order to increase diaphragm life.

A new design of pump body has been developed with anti-clog ball valves, the chamber of which is cast on to the pump body instead of being bolted on. Suction and delivery elbows are mounted at one end of the pump, and both have three optional positions, enabling suction and delivery connections to be moved through 180 deg. for convenience of installation in inaccessible positions. Care has been taken to place the suction and delivery elbows out of the way while towing, and at the same time to have them in an accessible position for coupling purposes.

The standard engine fitted is the Lister LD.1 air cooled diesel, but alternatives of the Petter PAZ.1 diesel, Lister L type petrol, or Villiers lightweight air cooled petrol engines are available. Electric drive can also be provided to order, and the pump can either be mobile or stationary mounted as desired. The mobile unit is normally mounted on two wheels and provided with a tow hitch for towing around the site or manhandling.

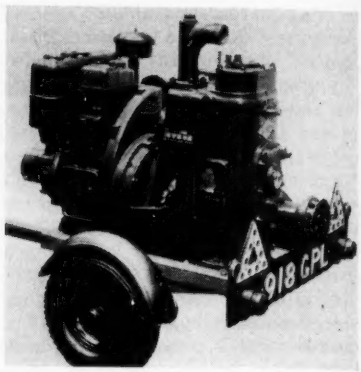
A new trailer mounted version of their standard UVS2 Univac pump has been introduced by Henry Sykes Ltd. The UVS2 is a 3/3.5 h.p. diesel powered self-priming centrifugal pump which incorporates a rotary vacuum pump in its design, thus enabling it to pump on snore at a maximum suction lift of 26/28 ft. The impeller is of the 3-bladed type and is of cast iron, as are the wearing plates and casing. Heavy duty coarse thread hose unions designed to B.S.1782 specification are employed for the suction and delivery branches, these having six threads per inch to facilitate coupling of the 2½ in. bore 3-ply special corrugated heavy duty suction and discharge hoses of reinforced rubber and canvas construction. The pump is thus suitable for operating a small well point dewatering system in addition to handling free flowing slurries containing up to 1 in. dia. solids and for use where instantaneous self-priming is required.





The output of the pump at 1,500 r.p.m., is 8,000 g.p.h., at a total head from all causes of 20 ft., the output at 39 ft., being 3,000 g.p.h. At 10 ft. vertical suction lift and nominal delivery, the capacity is 6,500 g.p.h., this being 3,300 g.p.h. at 26 ft. suction lift. The pump is close coupled to an air cooled, four stroke, direct injection Lister LD.1 diesel engine which develops 3 b.h.p., at 1,500 r.p.m., and 3.5 b.h.p., at 1,800 r.p.m. The complete unit has an overall length of 7 ft., a width of 3 ft. 8 in. and a height of 3 ft. 8 in. The weight is 758 lb.

A leaflet just published by Firth Cleveland Pumps Ltd., a member of the Firth Cleveland Group, is the first to collect and illustrate in graph form technical data on the company's range of single stage self-priming universal drive centrifugal pumps. These pumps, which have hitherto been available to special order, are now going into quantity production at the company's new Earl Shilton factory.



Universal drive models are particularly suitable for general industrial applications where tractor power take-off is available. They are supplied with pulley and drive shafts for coupling to any of the normal power sources: electric motor, petrol, diesel or steam engine. Each pump is 100 per cent self-priming even after the pump has been laid on its side or otherwise tilted or shaken about. It will also prime with only one-third the normal water level in the pumps. There are six models in the range with discharges from 18 to 1,100 g.p.m.

NEW GATE-END BOX

The newest addition to the Belmos Co.'s range of flameproof control gear is the SGU30 gate-end box. This unit is a smaller version of the well-established SGU2 gate-end box. It is designed in accordance with NCB recommendation for the control of small motors and is fitted with earth leakage protection, an intrinsically safe earth leakage lockout circuit and low voltage control circuit, unless otherwise specified. Two auxiliary side sockets are provided for remote control, and sequence facilities are fitted, including a rotary switch for selecting local/remote and sequence/independent control.

The enclosure comprises a welded steel case divided horizontally into two flameproof compartments; the upper chamber contains a triple-pole reversing isolating switch with a tested breaking capacity of 240 amperes at 650 volts, 0.25 power factor, and the throughgoing busbars, which have a continuous rating of 300 amperes; the lower chamber contains the contactor and its control and protective equipment which are mounted on a withdrawable chassis for ease of inspection and maintenance. The contactor complies with B.S.775: 1956 for category A4 and

At top right of this page, the electrically operated Sykes UVS2 Univac pump. In centre of the page, is the Mark 4 mud pump manufactured by C. H. Johnson (Machinery) Ltd. Below, alongside, is the Belmos Type SGU30 gate-end box.

has a continuous current rating of 30 amperes. The making and breaking capacity is 240 amperes at 650 volts, 0.25 power factor.

EXPLOSIVE FOR LAND PROSPECTING

Seismex, a powerful explosive specially developed by Imperial Chemical Industries Ltd. for use in seismic prospecting, has the advantage of great safety against premature detonation. It cannot be detonated with an ordinary detonator, but requires a special Seismex primer which is supplied separately.

Seismex and Seismex primers have excellent storage properties and can be used under all normal hydrostatic pressures met in seismic prospecting. Seismex is similar in strength to the gelatinous seismic explosives and can replace these types on a weight for weight basis.

For land prospecting Seismex is supplied in two sizes, 2½ in. × 1 lb. and 2 in. × 1 lb. canisters. Each is provided with a male triple-start thread at one end and a female triple-start thread at the other end, so that any number of tins can be coupled together in a continuous column.

The primers for Seismex are similar in size and construction to Seismex, but are painted with three red bands for ease of recognition. In the female end of the primer there is a recess for a Nobel seismic electric detonator. A special plastic detonator shield is supplied to screw into the female end of the primer and hold the detonator in place.

To assist in loading Seismex in difficult shotholes, loading points and centralizers can be supplied. Loading points are conical in shape and have a female thread which can be screwed on to the male thread of the leading Seismex tin in a column of charges. Centralizers are star-shaped pieces of spring metal intended for fitting between the canisters in a column of Seismex. The centralizer is slightly larger than the normal seismic drill hole and is designed to keep the tins centrally in the hole when lowering the charge and also prevent them from floating when they are lowered in mud-filled holes.

Seismex canisters are packed in columns of five. To prepare the charge, the required number of tins are screwed together, placing one centraliser between each column of five canisters. When a column is assembled, one Seismex primer is screwed to the top of the column. In holes with high hydrostatic pressure it is recommended that a primer should be inserted in the charge at intervals of 5 or 10 tins to ensure continuous propagation. The charge is now ready for loading into the shothole. This is usually done by the shooter's assistant.

The shooter now takes a seismic detonator from the shooting truck and assembles it on the detonator shield. This is done by pushing the detonator and approximately 3 in. leading wire through the hole in the shield from the screw thread upwards and then bending the wire back through the slot. The free end of the wire is then pulled back along the slot. The detonator and leading wires are then in the correct position for inserting into the primer. The detonator should not be inserted into the detonator recess and the shield screwed home until the charge has been lowered into the top of the shothole. The charge is then ready to be poled down the hole in the normal manner.

Equipment Digest

The Engineering Group of The General Electric Co. Ltd. has recently extended its range of circular electric lifting magnets to include two new sizes, namely 30 in. and 80 in. dia. magnets. Full information of these two new sizes is included in the revised edition of *Technical Description No. 379*. In addition to standard circular lifting magnets, G.E.C. makes many other types including those for handling hot ingots to 650 deg. C.; for lifting coils of steel strip; and for charging rotary furnaces with operating temperatures up to 1,000 deg. C.

*

The Monogard, a swivel facescreen protector, is claimed as the first of its kind to be placed on the British or European markets. Providing full facial protection, it is so designed that it will not permanently mist up under any conditions, does away with the "shut-in" feeling common with goggles, spectacles and screens, and permits the widest possible uninterrupted field of vision. These advantages are obtained by supplying a combined phosphor-bronze mesh and plastic visor. The plastic visor is held firmly in position and yet can be quickly replaced in seconds without the use of tools.

A versatile shield, it can be fitted with a clear screen for general protection against flying particles or chemical splashes, green anti-glare for light reduction and either GW1, 2, 3 or 4 for gas welding. Manufactured by Safety Service Co. Ltd.

*

R. and J. Dick Ltd., have introduced a new type of flexible coupling which will provide dependable power and withstand all types of misalignment and end float. The coupling, called Quadriflex, was announced at the firm's group conference held recently in Glasgow. A Quadriflex coupling is simple in design, consisting of two flanges and a two-piece flexible rubber sleeve. The teeth of the sleeve halves lock into the teeth of the flanges without clamps or screws and tighten under torque to provide smooth transmission of power. The coupling is easily installed and unaffected by abrasives, dirt or moisture. There is no metal to metal contact and the absence of wear eliminates the need for lubrication or maintenance. Operation is noiseless.

*

A new protective rubber boot — the Steelex—is announced by the Footwear Division of BTR Industries Ltd. Believed to be the first industrial rubber boot manufactured with an external steel toe cap, the visible safety provided gives the wearer complete confidence in his foot protection. The toe cap is designed to withstand a 150 ft. lb. blow and conforms to BS953, Grade 1. Steelex boots are available with or without spring-steel midsoles and claim to have twice the life of conventional rubber safety boots.

The 3rd edition of Publication No. 37 is the first fully descriptive, fully illustrated 48-page catalogue issued by Keith Blackman Ltd. to describe their range of Type AR, aerofoil section backward bladed centrifugal fans. The first and second editions were in leaflet and folder form. This new, two-colour edition provides full details concerning the design of impellers, casings, drive arrangements, bearings, maintenance, etc., plus extensive capacity tables ranging from 1,000 to 50,000 c.f.m. with pressures from 1.0 to 15.0 in. swg. Dimension tables and drawings are also included. This fan is designed for forced and induced draught boiler installations, for air conditioning, ventilation of buildings and mines and general industrial use.

In addition, a Keith Blackman pamphlet dealing with a piece of equipment new to this country is Publication No. 51 which illustrates and describes the Tornado-Fischer automatic self-cleaning filter. Its efficiency in handling dust particles of virtually all sizes rests on the special design of the filter elements, the type of filter fabric and the patented cleaning mechanism. Negligible maintenance is required, it being necessary to lubricate only the motor and damper bearings occasionally, other moving parts being contained in dust-tight enclosures which enable them to function continuously without attention. The following is a representative list of the types of dusts handled by the Tornado-Fischer filter, in which the temperature of the air or other gas passing through can be as high as 350 deg. C.: blast furnace slag, carborundum, cement, chemical products, coal dust, fluorspar, lime products, ore dressing, slag-sand, stone dust.

*

Stearns Magnetic Products (U.S.) have introduced a new type of single roll induced magnetic separator known as the K.T. which is said to have an exceptionally high field intensity and recommended for use on particles between 10 and 200 mesh.

*

Roller mills such as the Raymond mill are commonly used for fine grinding of soft minerals such as barytes but better results are claimed by Allis Chalmers using a vibrating ball mill. A 30 in. unit is now being employed by International Minerals, Inc., of York, U.S., and both lower initial cost and maintenance are claimed whilst a finer product is made.

*

The abrasive wear problem in impact crushers has been attacked by using tungsten carbide parts, but perhaps the most interesting one is the attempt which has been made to use an autogenous lining by Simplicity Engineering Co. in the United States. Both the rotating element and the outer shell have been designed to hold some of the raw material and form a hard packed cake.

MINING MISCELLANY

The Colonial Secretary has approved a grant of £11,869 from the Colonial Development and Welfare Funds for the continuation of carbonatite investigations in Nyasaland. The new grant covers research works on the mineral for 1960-63.

★

Norway's second largest producer of iron ore concentrate, Fosdalens Bergverks A/S, at Trondelag, is sinking a new 1,200 m. shaft to tap vast ore deposits sufficient for 15 years' exploitation. Rana Grube, 30 km. from the State Iron Works at Mo-i-Rana, expects to complete its trial workings later this year. If these prove successful, the mine could supply all the ore needed by the State Iron Works, which is at present supplied from the distant Sydvaranger and Fosdalens mines. The Ministry of Industries is to survey nickel ore desposits in the Rana district, where German surveys during the war found ore containing 0.15 per cent nickel.

★

It is reported from Norway that Orkla Grube A/S is joining other pyrites producers in establishing a research institute to find new uses for pyrites, as a result of over-production. Orkla have opened a new department for industrial research particularly on the uses of sulphur in metallurgical fields.

★

A deposit of uranium, reported to be of high grade has been discovered near Hanamaki in Iwate Prefecture, Japan, and ore with 0.12-0.25 per cent uranium has been found in the Kanamaru mine in Yamagata Prefecture.

★

A West German construction firm has signed a 10-year agreement with the Icelandic municipality of Hafnarfjordur for quarrying and exporting pumice stone. The German firm will start operations this year, and has undertaken to export up to 50,000 tons of pumice annually after 1963.

★

In Argentina the first blast furnace of the State-controlled San Nicolas steel plant is now in operation, and production of steel is scheduled to commence in 1961. The steel plant will process initially the output of three blast furnaces, and it is hoped to install another two in a few years' time.

★

A tender for the exploitation of iron ore deposits in the Sierras Grandes region of Rio Negro, Argentina, has been awarded to a group formed by the Southern Cross Steel and Mining Co. of U.S.A., and Minera Alumine S.A. of Argentina, a British company being associated with the group. After the initial exploratory work, the group has undertaken to promote establishment of a mining and steel industry in the area, if deposits of at least 80,000,000 tons of ore are proved.

★

Some 6,000 tonnes of mined lead and about 12,000 tonnes of furnace lead were produced in Roumania during 1959, thus maintaining the 1958 level.

It is reported from Indonesia that 30,000 people have migrated to Central Kalimantan as diamond prospectors, following the discovery of diamonds in a shallow river bed in mid-April. The diamonds originally discovered are reported to have realized more than 1,000,000 rupiah.

★

Southern Rhodesia produced manganese in June for the first time this year, when Dan Mine's output was 1,350 tons. Dan Mine is owned by Rhodesian Iron and Steel Corporation. Last year 2,000 tons were produced, compared with 2,500 in 1958 and 1,780 in 1957. Before 1957, a total of 3,938 tons was produced.

★

Boring for new coal seams has begun in the Connacht coalfield near Drumshanbo, Co. Leitrim, under the Eire Government's mineral exploration scheme, which is expected to last at least a year. Fourteen bores are to be made in the Arigna and Sleevanerin areas where seven mining companies employing 300 men are operating. The scheme is being financed through the American Counterpart Fund. The Irish Electricity Supply Board's coal burning power station, on the western shore of Lough Allen, about four miles from Drumshanbo, consumes between 40,000 and 50,000 tons of locally-mined coal, considerably less than the total output of the mines, working a four-day week.

★

An important new industry will shortly be established in New Zealand under a joint arrangement by Imperial Chemical Industries of Australia and New Zealand Ltd. (ICIANZ) and Yorkshire Imperial Metals of Leeds, Yorks. The new industry will manufacture copper and copper alloy sheet, strip and tube. Capital of over £(N.Z.)2,000,000 will be required, and it is expected that an ICIANZ subsidiary company will be formed in New Zealand to conduct manufacturing operations. The arrangement is still subject to ratification by the boards of ICIANZ and Yorkshire Imperial Metals, and also by the U.K. Capital Issues Committee and Treasury. The plant is likely to be in the Auckland area, and production is expected to commence in about 18 months.

★

The Jordan Phosphate Mines Co., produced 337,624 tons of phosphates in 1959, most of which was exported. The new phosphate loading berth at Aquaba has helped in handling of exports, but difficulties are being experienced in finding markets for the phosphates, and a trade delegation has visited India and Japan. A contract worth JD.475,000 for civil engineering work for a scheme for opencast mining of phosphates was awarded to a local company.

★

Rainfall, averaging more than 11 in. daily for three days, has suspended steel production at Anshan, China's oldest and largest iron and steel centre. This stoppage in production, from beginning of August till August 17, may make severe inroads into Chinese iron and steel targets, reported to be 27,500,000 and 18,400,000 tons respectively for 1960.

Metals, including copper, nickel ferrous metals and alloys and aluminium formed Norway's highest single export in 1959, accounting for £73,750,000 out of a total export figure of £289,000,000. Corresponding figures for 1958 were £62,750,000 and £265,750,000 respectively.

★

Recently released figures give Soviet Russia's output of mined lead at 275,000 tonnes and smelter lead as 325,000 tonnes for 1959, compared with 260,000 and 310,000 tonnes respectively for 1958. Zinc production totalled 350,000 tonnes for mined output (330,000 in 1958) and 375,000 (365,000) for smelter output.

★

An airborne magnetometer survey of a 21,000 sq. mile area in northeastern Alaska will be completed soon by Fairchild Aerial Surveys Inc., a subsidiary of Fairchild Camera and Instrument Corporation of Syosset, N.Y. The survey is being undertaken for five U.S. oil companies, and will be reconnaissance work to give a quick overall picture of this relatively unexplored area.

★

It is officially reported from Hanoi that 1959 output from North Viet Nam's principal colliery, Hang Gai, reached a new peak of 2,187,214 tons, with daily output per miner reported to be 5.8 tons, compared with 2.83 tons before 1955, when annual output was just over 560,000 tons. Large quantities of mechanized mining and transport equipment have been brought to the mine by U.S.S.R., China and Czechoslovakia—excavators have increased five-fold and transport lorries ten-fold in the last five years.

★

The Thailand Mines Department is conducting surveys for copper ores in four provinces—Chacherngsao, Nakorn Rajsima, Lopburi and Pechabun.

★

A National Coal Industry Committee was formed in Peru by Supreme Decree No. 12, of May 13. It has been asked to prepare recommendations for co-ordinating and accelerating plans to develop the domestic coal industry. A plant which would gasify up to 3,000 tons of coal in the Santa valley daily, and supply it by 40 cm. pipeline to Lima and industrial establishments on the coast, is being considered. The total cost of plant and pipeline is estimated at $U.S.30,000,000.

★

Mexican production of sulphur reached 593,395 l.tons in the first half of 1960, an increase on 1959. Total production for 1960 is estimated at 1,200,000 l.tons. Fresh discoveries of sulphur, including one undersea, have been reported.

★

Canada Tungsten Mining Corporation has started surface trenching on a new tungsten find on its property in the Flat River area, North West Territory, 150 miles north of Watson Lake on the Alaska Highway, reports the *Northern Miner*. An X-ray drill is being taken in to assist investigation of the new find.

Company News

The Transformer Division of Associated Electrical Industries has received an order from G. W. B. Furnaces, of Dudley, Worc., for two 40,000-kVA. arc furnace transformers. These will be the largest furnace transformers ever used in a steel works; they are the first two of a total of six units that will ultimately be required for a £10,000,000 electric steel melting plant to be installed in the Templeborough melting shop of the Steel, Peech and Tozer branch of United Steel Companies. Each transformer will provide a supply to an electric arc furnace of 110 tons nominal capacity. They will operate on a 33-kV. 3-ph. 50 c/s supply, stepping down at full load and 0.92 p.f. to output voltages ranging from 565 V. down to 200 V. in fourteen steps.

★

Edgar Allen and Co. announce that one of their subsidiary companies, Buell Ltd., of London, has recently obtained an order, to the value of £200,000, from the Lancashire Steel Manufacturing Co., for the supply of Buell drying plant complete with Buell high efficiency dust collectors and other ancillary equipment. The plant will handle 225 tons per hour of wet Northants ore, containing an average moisture not exceeding 18 per cent, to be dried to a final moisture content not exceeding 12 per cent. Buell are erecting this plant completely on their client's prepared foundations. Orders obtained by Buell also include the supply of their high efficiency dust collection system for the discharge end of a sinter machine and also extensions to an existing dust collecting plant, at a total value of over £30,000. A further order, at an approximate value of £100,000 is for the erection of three Buell vertical turbo dryers, each with an output of 9½ tons per hour of china clay, at different sites in the Cornish area, the first to be in operation by March, 1961.

★

Huntington, Heberlein and Co., are to build a special sinter plant for use in connection with research work on new low shaft blast furnace techniques for La Comite Internationale de Recherche Metallurgique at Liege, Belgium. Huntington Heberlein are a subsidiary company of Simon-Carves, Ltd.

★

NCK-Rapier Ltd. of London are to be exclusive selling agents in most of the Eastern Hemisphere for the Koehring Co., of the U.S. The agreement will operate primarily for Koehring excavators and cranes, but it is expected that an extension of the activity will eventually cover road and building equipment, dumpers and other well-known Koehring products. NCK-Rapier is the selling organization for excavators and cranes made by Newton Chambers and Co., the parent company, of Sheffield, and by Ransomes and Rapier of Ipswich. Newton Chambers have had a licence agreement with Koehrings for many years for the manufacture of excavators and cranes — "NCK" machines representing "NC": Newton Chambers and "K": Koehring.

The Maydown works of the Du Pont Co. (U.K.) built to produce neoprene synthetic rubber, were officially opened by H.E. the Lord Wakehurst, Governor of Northern Ireland.

★

Plowright Brothers Coal Preparation Plant Division has received the complete contract, including civil engineering and electrical works, from the National Coal Board for a 250 tons per hour Baum Type washery for Maltby Colliery, No. 1 Area, North Eastern Division.

★

The Rhodesian company of the Cementation Group, who have been awarded the contract for exploratory work in connection with the second phase of the Kariba power scheme, are now driving a complex of tunnels through the hill on the north bank. Drilling and blasting operations have started, and tests are being made of the rock to be hollowed for the second power house, which will be about 50 per cent larger than the existing ones. Preliminary work is expected to be completed early in 1961, and construction of the north bank power house should begin in 1962, all the work being timed to be completed when Rhodesia will need the increased power.

Imperial Chemical Industries announce that, for administrative reasons, their Salt Division will be merged into the Alkali Division on January 1, 1961. General policy regarding production, sales of salt, and relations with suppliers and customers will continue unchanged. The Salt Division has three works producing white salt: at Weston Point, on the Manchester Ship Canal, at Stoke Works near Droitwich, and at Winsford in Cheshire, where the division also operates the only rock salt mine in Britain. A major scheme of extension and development of the mine, designed to more than double its capacity, is now nearing completion.

★

A £252,000 contract for the reconstruction of colliery buildings and installations for the National Coal Board at Shirebrook colliery, Yorks., has been awarded to J. L. Kier and Co.

★

The Engineering Group of The General Electric Co. Ltd., announces that it has reorganized its representation at the company's branches in Great Britain under five area chief engineers. This has been done in order that the four areas in England and Wales shall conform more closely to those of the Central Electricity Generating Board's generating divisions and area boards. The territories covered by the south of Scotland Electricity Board and the North of Scotland Hydro-electric Board will remain the responsibility of the Scottish area chief engineer.

Personal

The following new appointments have recently been made by Atlas Copco (G.B.) of Hemel Hempstead, Herts; Mr. A. Hayes is now the company's chief sales engineer for mining products in Great Britain; Mr. W. T. Jones has been appointed manager of Atlas Copco's mining division; Mr. R. Marshall has been appointed technical representative for Great Britain; Mr. Ralph Noren has been appointed manager for stationary compressor sales, and Mr. T. M. Horn who retired in 1959 from the company's Leeds branch is with Atlas Copco in an advisory capacity.

★

The Liberian American-Swedish Minerals Co., Monrovia (LAMCO) has appointed Mr. Ake Karlstrom as managing director. He succeeds Dr. Sture Linner.

★

The National Coal Board announce the following appointments: Mr. P. G. Innel Clement has returned to the position of Divisional Public Relations Office of the West Midlands Divisional Coal Board after an illness. Mr. A. Homeshaw has been appointed Assistant Public Relations Officer, as from August 22. Mr. W. H. Craig, marketing director of the Scottish Division, will retire early in October next, owing to ill-health and will be succeeded by Mr. William MacLeod, at present Deputy Marketing Director (Commercial) Scottish Division.

Mr. G. A. Black, export director of Martin, Black & Co. (Wire Ropes), Ltd. has begun a three-month world export tour; places he will visit include the Far East, Western and Eastern U.S.A. and Canada.

★

The appointment is announced of Mr. James E. Quinn as general sales manager for Denver Equipment Co.

★

We regret to record the death in London last Saturday of Mr. D. W. Watson, Joint Secretary of the Nigerian Chamber of Mines.

★

Mr. Leo Fantle has been appointed manager of the new Johannesburg Computer Service Bureau. One of his first tasks will be to plan for computer operation the payrolls for many thousands of Africans employed in the Witwatersrand and O.F.S. goldfields. The Johannesburg Computer Service Bureau was set up in June last by LEO Computer Services (Pty.), a company established jointly by Rand Mines and LEO Computers of London, where Mr. Fantle was programming manager.

★

Hadfields, Ltd., announce the appointment of two further local directors: Mr. Denis R. Ward, assistant secretary of the company and secretary of the subsidiary companies in the group, and Mr. Arthur W. Gurney, who is chief cost accountant of the company.

Metals and Minerals

Expansion of Australia's Aluminium Industry

Australia's aluminium industry is to expand considerably in the next few years, according to a survey by the Department of Trade. The survey points out that the expansion contemplated by the Australian Aluminium Production Commission will make some contribution to satisfying increased demand. However, local users will continue to face problems associated with the high price paid for locally-produced metal.

It is estimated that consumption of primary aluminium in 1965 could rise to 47,000 tons, nearly double the 1957-58 consumption. The aluminium plant at Bell Bay, Tasmania, is producing about one-third of Australian industry's present consumption of ingot, but production costs are considerably above those of the main overseas producers. It is planned to expand output to 16,000 tons by 1962, but this would still be less than half industry's needs.

The aluminium industry is increasing its capacity in most of its activities, including rolling, extruding and drawing. Two rolling mill projects alone scheduled for completion this year involve investments of £3,000,000 and £1,250,000 respectively. Another project in the planning stage provides for the establishment at a cost of £A.1,850,000 of a new plant to fabricate aluminium sheet and strip by a continuous casting process.

On past experience, as new uses of aluminium are developed overseas, many will become popular in Australia. Consumption of aluminium for building and construction purposes, and in the transport industries, might be expected to increase considerably within the next few years.

The local market is small by world standards and any major expansion involving exploitation of the huge bauxite resources of Northern Australia would entail export of much of the metal produced. Indicated reserves of bauxite throughout Australia exceed 1,115,000,000 tons.

As we go to press this prospect, held out by the Department of Trade's survey, of inadequate and high-priced domestic supplies of aluminium has been greatly changed by yesterday's announcement of a long-term project involving the expansion of annual capacity at the Bell Bay plant, initially to 28,000 tons and later to 40,000 or 50,000 tons. At this level of output production costs should be competitive and supplies adequate to meet domestic consumption (estimated at 47,000 tons by 1965). As reported more fully on page 266, the management of the Bell Bay plant will be taken over by the Commonwealth Aluminium Corporation, owned jointly by the Consolidated Zinc Corporation and British Aluminium.

*

Expansion of facilities to reach an estimated production capacity of 40,000 tons of primary aluminium per year in Brazil is foreseen by Mr. F. A. Sievert, president of Aluminio do Brazil, S.A., an important subsidiary of Aluminium Ltd. Primary aluminium production in Brazil has increased from 2,000 tons in 1951 to an estimated 18,000 tons this year. The country's two established producers, Aluminio Minas Gerais, a subsidiary of Aluminio do Brasil, and Companhia Brasiliera de Aluminio, a company owned by Brazilian capital, have drawn up plans that will bring their capacity up to 40,000 tons in the next few years.

*

According to statistics prepared by the Aluminium Association for the first quarter of 1960, building products led the way as the major aluminium consuming field in the U.S. with a share of 18.6 per cent. The transport section (including mobile homes) came a close second with 18.0 per cent. Shipments to distributors and jobbers are next in line with a percentage of 14.1, but these are not specified as regard end-uses of the products. The third place for known uses of aluminium was therefore occupied by consumer durable goods with 12.6 per cent of shipments. Fourth and fifth places went to electrical applications (9.6 per cent) and containers and packaging (9.5 per cent).

*

Reynolds Metals are to supply more than 100,000 s.tons of various aluminium shapes for use in the building of the U.S. Navy's giant radio-telescope under construction at Sugar Grove, West Virginia. The aluminium will go to North American Aviation, Inc., to fashion the panels for a huge saucer-shaped reflector disc with a diameter of 600 ft.

*

It is further reported that aluminium has won a major contract in a market long dominated by steel and cement. Reynolds metals are to supply about 1,000 s.tons of aluminium for 35 miles of all-aluminium centre guard posts and guard rails along two highways in New York City. Aluminium was chosen, said the announcement, because it was cheaper than stainless steel and more corrosion-resistant than plain steel.

*

A new product recently developed in West Germany is known as "foam aluminium." As described in the current issue of *Mineral Trade Notes*, this material looks like a slice of coarse bread. Depending on its porosity, it weighs from 12 to 40 lb. per cu. ft. Normally, foam aluminium will absorb water and sink, but if its exterior pores are sealed it will float. Compressive and tensile strengths are low but stiffening properties are reported to be excellent. It can be produced in strips of 76 or 100 mm. thickness, in unlimited lengths, and can be sawed, nailed, glued or soldered.

Once mass production has begun, foam aluminium manufacturers hope to be able to market the product at a price competitive with timber, over which it has the advantage that it is not flammable and is impervious to rot. The material is already being used in construction elements of jet planes, in floats for tanks and carburettors, and as a substitute for timber in some building applications.

RECOVERY OF METALLIC ANTIMONY

A new process to recover metallic antimony from concentrate has been developed in Austria by the mineral trading company Erzhuette A.G., in co-operation with Ing. Othmar Ruthner. A plant based on this process is being constructed by Donay Chemie A.G. in Brueckl, Carinthia. On its completion, all antimony concentrate formerly processed in western Europe will be smelted in Austria.

MANGANESE MARKET LITTLE CHANGED

Generally speaking, the manganese ore market calls for little fresh comment. Consuming countries still appear to be adequately covered under existing contracts; hence the quietness of marginal requirements, which may also be attributed partly to seasonal considerations. Although actual consumption has been quite satisfactory, the tone of the market does not look too assured. Supplies of most grades of ores are plentiful and stocks in some consuming countries are presumably still useful. Traders hope that, once seasonal influences are out of the way, interest will quicken since in the course of the next two months or so buyers will have to start thinking about next year's supplies.

*

The State Trading Corporation of India has entered into a barter agreement with four U.S. firms for the import of raw cotton against export of manganese.

*

A new plant with capacity to produce 44,000 tons of ferro-manganese annually is to be established shortly in Dandeli (Mysore State) at a cost of about Rs. 12,500,000. At present 10,000 tons of ferro-manganese are being produced annually at the existing Dandeli plant.

U.S. SELENIUM OUTPUT RISES

U.S. domestic production of selenium and selenium compounds in the second quarter of 1960 amounted to 177,946 lb., of contained selenium, according to reports received from selenium producers by the U.S. Bureau of Mines. The output was 6 per cent higher than the first quarter production of 167,931 lb. In all 1959 production totalled approximately 800,000 lb. Shipments in the second quarter of this year rose to 188,771 lb. from 167,724 lb. shipped in the previous three months.

*

Commercial production of primary magnesium during the second quarter of 1960 was 9,605 s.tons. This was 530 tons below the figure for the first quarter, but total production for the first half of the year was 54 per cent above that of the first six months of 1959.

Producers' shipments in the second quarter were 180 tons lower than in the first quarter, but total shipments for the first half of the year were 10 per cent above those in the first six months of 1959.

EXPANSION OF PAKISTAN'S CHROMITE OUTPUT

The *Pakistan News* reports that the Government of Pakistan has finalized a scheme to raise the production of chromite from 18,000 tons to 50,000 tons per annum by 1964. In order to stimulate production, the government has issued licences for the import of heavy machinery and equipment. The report states that the Kharian and Raz Koh mine areas, where high grade chromite has been discovered in commerical quantities, are likely to be developed shortly. A scheme for concentrating low grade chromite is also stated to be under examination, as well as the feasibility of establishing a ferro-chrome plant.

*

A U.S. company, the Chromium Mining and Smelting Corp., has increased prices by an average of 4 per cent on a number of chromium products, most of which are consumed in the steel industry. This move follows similar action by other U.S. firms in the chromium industry, but includes a greater number of products. The increase is the first in three years and ends a decline that began last year. The new prices are for the most part still slightly under the levels ruling a year ago.

WOLFRAM REMAINS FIRM

Despite further sales of some low-priced wolfram ore, presumably of Russian origin, to the Continent, prices in London have not been lowered, as they were on the last occasion. A slightly wider shipment price is now indicated, quotations ranging from 155s. to 161s. per l.ton unit c.i.f. Europe, against 155s.-160s. previously. Business generally still remains quiet.

AND NOW "INSMETALS"

Licensing agreements to produce a new family of metals known as insmetals have been signed by Knapp Mills Inc., of the U.S.A., and Bleiwerk Goslar GmbH of Goslar, West Germany. Currently there are five insmetals being produced by the Knapp process by eight companies in the U.S., Canada and Europe.

These new materials are used in the manufacture of complex gamma shielding throughout the atomic industries. They consist of metallurgically bonded lead surfaces in various thicknesses combined with other metals; with aluminium the material is known as bauxilium; with copper, as curpalum; with carbon steel as ferrolum; with stainless steel or nickel alloys as nicrolum, and with stainless clad carbon steel as ferro-nicrolum.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

The week has again seen fair activity in the copper market with the re-establishment of a contango and lower price levels being reached: the tin market is still trying to assess the consequences of the International Tin Council's decision to free export: the lead and zinc markets have both developed a steadier undertone following more industrial demand as works open up again after the holidays.

COPPER CUTBACKS HOW SOON?

At the end of last week the U.S. Copper Association's figures for the domestic consumption of copper by brass and wire mills and foundries for the month of July were published and these made the worst showing for a long time. Consumption based on shipments of fabricated products totalled 75,399 s.tons as against 112,223 s.tons in June. New business booked fell to 70,003 s.tons as compared with 127,143 s.tons and unfulfilled orders declined by about 5,500 tons to 126,674 tons. Fabricators stocks of refined copper rose about 8,000 tons to a total of 459,871 tons. These figures were read against a background of reports from the U.S. that demand for copper was still unsatisfactory and that the chances of a pick-up after Labour Day appeared to be fading.

At the beginning of this week the stocks in official U.K. warehouses showed an unexpectedly large increase of 903 tons, bringing the total up to 7,111 tons and at the same time news was received that the Katanga production was still according to schedule and that the metal produced was all being shipped to the ports of Beira or Lobito Bay. The London price developed weakness and on Tuesday the Belgians followed suit, lowering their quotation from the equivalent of approximately 30.60 c. per lb. to about 29.95 c. per lb. Antwerp or New York.

By the middle of the week the scrap price in the U.S. was reduced 25½ c. and there was talk of a reduction in the customs smelter price after Labour Day. As happens when markets begin to weaken, consumer interest faded and with the establishment of a contango operators were more inclined to offer 3 months metal.

In the field of wage negotiations an agreement was reached in Rhodesia whereby African Mineworkers on the Copperbelt received and accepted a wage increase, attached to which was a clause that wages should remain unchanged until December 31, 1961. In Chile union negotiations with Anaconda and Chuquicamata are taking a slightly different course to that which has become regarded as normal and although the odds are still on a strike there are a number of observers who think that it may now be avoided.

In the event of the situation in the Congo not deteriorating the majority of observers feel that the copper price will go below £235 per ton and that then there will be reports of producers considering cutbacks in production as it is fairly generally agreed that no serious decline in the price will occur without some remedial action being taken at an early stage by the major producers.

TIN QUOTAS SUSPENDED

Contrary to expectations, the International Tin Council did not continue the export quotas and announced that no quota would be fixed for the quarter commencing October 1, 1960. This means that in addition to mines being able to produce as much as possible, any stocks which have been held up will also be free to come on to the market but it is generally considered that such stocks only amount to a few thousand tons and in any case will only be released gradually so as not to disturb the price. The decision was taken "in view of the statistical position" and it is to be assumed that the Council is satisfied that consumption will continue at, or even above, its present level and that on the production side there is no major possibility of large increases.

In London the market reacted violently downwards on receipt of the news but dealings were not particularly active and during the first part of this week almost all the ground lost had been regained although the previous buoyant undertone had been replaced by one of hesitancy. U.K. stocks fell slightly at the beginning of the week by 109 tons to 9,572 tons.

On Thursday the Eastern price was equivalent to £810¼ per ton c.i.f. Europe.

LEAD AND ZINC FIRMER

After their period of weakness both the lead and zinc markets have shown signs of recovery although it is difficult to pinpoint the cause.

Demand for lead manufactures remains good and as it is understood that offerings of Spanish lead have virtually ceased and shipments from at least one other source have been slightly delayed, there is a tendency for buyers to cover their requirements of metal as they arise.

In the case of zinc it seems probable that the upturn is a natural reaction to relatively violent downward movement which took place last week as demand is still reported as being "spotty".

Closing prices are as follows:

	August 25		September 1	
	Buyers	*Sellers*	*Buyers*	*Sellers*
COPPER				
Cash	£241½	£242	£234	£234¼
Three months ..	£241	£241½	£234¼	£234¼
Settlement ..	£242		£234¼	
Week's turnover	11,500 tons		12,025 tons	
LEAD				
Current ½ month	£70⅜	£70⅞	£71	£71⅛
Three months ..	£71	£71⅛	£71⅛	£71⅜
Week's turnover	6,675 tons		5,125 tons	
TIN				
Cash	£802½	£803	£802¼	£803
Three months ..	£804	£805	£802½	£803
Settlement ..	£803		£803	
Week's turnover	585 tons		470 tons	
ZINC				
Current ½ month	£85⅜	£85⅝	£85½	£86
Three months ..	£85⅜	£85½	£85½	£86
Week's turnover	9,675 tons		3,350 tons	

London Metal and Ore Prices appear on inside back cover.

Mining Finance

Another Rich Strike at F.S. Geduld

By contrast with the rather uninspiring technical news from President Brand, President Steyn and Western Areas, commented on here last week, Free State Geduld has come out with a fresh high-value reef strike on its Orange Free State property, a strike that was sufficiently impressive to help spark off a share market rally in South African golds as though in celebration of the ending of the emergency regulations in the Union which took place at long last on August 31 after having been in force since March 30.

The latest Free State Geduld Basal reef strike was in the new No. 1A ventilation shaft which is being put down in the south-western corner of the property to help ventilate the area in which the 9,772 inch-dwts strike was made in January, 1959. In the shaft the average value was a more modest 2,170 inch-dwts, but this is still high enough to be another pointer to the area of exceptional richness that lies to the south of the No. 1 shaft and which is in addition to that indicated by the original top-value Geduld boreholes to the south of No. 2 shaft.

Details of the 1A strike are that the Basai was intersected at a depth of 4,544 ft. below the shaft collar. The reef, striking north-west to south-east, dipped in a north-easterly direction at approximately 15 degrees. It was fully exposed round the perimeter of the shaft. Sampling yielded an average of 239.51 dwts (just under 12 ounces) gold per ton over a channel width of 9.06 inches. The inch-dwt figure of 2,170 inch-dwts compares with 2,235 inch-dwts from No. 1 shaft area development in the June quarter of this year and with overall development in the mine during that period averaging 1,496 inch-dwts.

The mine's ore reserves will be recalculated at the end of the current month and will be published on October 12. They are unlikely to show much in the way of grade improvement over the average of 20.86 dwts gold per ton for the reserves as at September 30, 1959. This will be because practically no additions to the reserves from the new rich area can yet have been made owing to the limited amount of development that has so far been practicable there. A better look at the reef should become possible during the early months of next year after the No. 1A shaft has been commissioned at the end of 1960. It will serve primarily as a ventilation shaft, but will have facilities for hoisting a limited amount of development ore.

The really progressive opening up of this south-western corner is unlikely until the further big new hoisting shaft, adjacent to 1A, comes into use. Details of this new shaft were given here on July 29. No official estimate of the completion date has been published, but with work on it still to start, it can hardly be brought into use before 1962.

Meanwhile, the next point of interest in Free State Geduld will be the final dividend for the year to September 30 due to be announced on September 8. Estimates range from an unchanged 4s. 6d. to 5s. The latter would make a total of 8s. 6d. for 1959-60 against 8s. per 5s. share a year previously. Much depends on Board policy in view of the capital cost of the proposed new shaft and the likelihood of tax liability starting in the not far distant future. Earnings are running at a rate of over 15s. a share per annum.

SAAIPLAAS ISSUE—MORE DETAILS

Forms of applications have now been sent out by Free State Saaiplaas Gold Mining company in respect of the 3,000,000 10s. shares that are being offered at par to shareholders registered on August 22. The closing date is September 16. As already announced, this is part of the 6,000,000 shares that are to be issued, the rest of which are in any case being subscribed for by a consortium consisting of Consolidated Gold Fields, Anglo American, West Wits, South African Mutual Finance Corporation, Federale Mynbou Beperk, the British South Africa Company and the South African & General Investment & Trust Company.

Saaiplaas have recovered to 10s. during the market rally in Kaffirs. This still does not make the offer to shareholders immediately attractive, but any shares subscribed will at least be free of stamp. Also it is possible, if the improvement in reef development values continues, that a modest medium-term profit might accrue. The shares, however, at this particular stage in this embryo O.F.S. gold mine's career are only for those able to take a fair degree of speculative risk.

NEW MOVE TO EXPLOIT AUSTRALIA'S BAUXITE

In a statement to the Australian Senate this week, Mr. W. H. Spooner, Minister for National Development, disclosed some further details of the plans for developing northern Queensland's huge bauxite deposits, a long-term project under the joint control of Consolidated Zinc Corporation and British Aluminium through a company called the Commonwealth Aluminium Corporation commonly known as Comalco.

Firstly, Mr. Spooner revealed that, although plans for full-scale development of these deposits were still in the formative stage, Comalco was already proposing the first large exploitation scheme by the investment of at least £A34,000,000 in the establishment of a port, township and alumina plant at Weipa, Queensland. Secondly, a £A9,400,000 investment was proposed in a major expansion of the Bell Bay aluminium plant in Tasmania, a hitherto small-scale government undertaking with a capacity of 12,500 tons of aluminium ingot per annum.

It was intended, Mr. Spooner said, to expand this initially to 28,000 tons with the objective of a later increase to between 40,000 and 50,00. tons. In this venture Consolidated Zinc would have a two-thirds interest and the Tasmanian Government one third.

Consolidated Zinc has asked that this Tasmanian industry be protected only in the period, estimated at four years, during which the expansion work would be in progress. Thereafter it is hoped to operate the plant profitably enough to be able to pay its shareholders 6½ per cent dividend without the benefit of protection and the company has agreed not to seek protection after the expansion period except in abnormal circumstances.

As may be seen, there is no early hope of the Bell Bay venture adding appreciably to the Consolidated Zinc group's profit-earning capacity. This, of course, applies to the whole aluminium project. It is essentially a long-term venture into which a huge amount of capital will have to be sunk. But it does add an eventual growth prospect to the group which is so widely interested in lead and zinc production in Australia and in smelting and allied undertakings in the United Kingdom through its wholly-owned subsidiary, Imperial Smelting.

Mr. Spooner said that some 12 per cent of Consolidated Zinc's share capital was held in Australia. The company had played "a notable part in Australian mining industry."

BERALT'S BIG RECOVERY

As anticipated in view of the considerably improved Wolfram price, Beralt Tin and Wolfram, the Portuguese producer, had a sharply better earnings experience in the year to March 31 last and the dividend is trebled at 3s. per 5s. stock unit with a final payment of 2s. Profit after Portuguese taxation was £212,864 compared with a loss of £78,986 in 1958-59 when the 1s. distribution was made out of profits accrued during previous years. U.K. taxes on this occasion take £85,415 against £16,720, leaving a net surplus of £127,449. Of this the total dividends absorb £121,643 and the carry-forward is some £5,000 higher at £94,996.

In March, 1959, wolfram was only 86s. 6d. per unit. In the year to last March it was over 160s. at one time. It is now quoted in the range 155s.-161s. So Beralt should have made a good start to its current financial year. Another factor in the 1959-60 results was the sharp increase in wolfram production. From 117 tons in April, 1959, output of concentrates rose to over 170 tons a month and the total for the year was 1,886 tons against 1,280 tons in 1958-59. As a somewhat natural corollary to this, tin output fell away from 40 tons a month in the early part of the period to under 10 tons for each of the past nine months. Production of wolfram concentrates continues to keep up well. It has totalled 657 tons in the first four months of 1960-61.

Beralt's annual report is due in October. It is likely to show a continuance of the company's strong financial position. The units are 33s. 9d. cum the final dividend to yield 9.2 per cent. They have, in fact, been remarkably steady this year, having only fluctuated between 28s. 6d. and 34s 6d. They look pretty fairly valued at the moment in view of wolfram's capacity for sharp fluctuations in value.

LONDON MARKET HIGHLIGHTS

After its recent dreary drift the South African gold share market maintained a brisk revival last Friday which continued into the early part of this week.

Oddly enough, the Cape, which had previously been providing what little support that there was for Kaffirs, played very little part in the latest upswing. The initiative was for once provided by London. Several reasons prompted the advance, chief among them being the rich shaft strike announced over the weekend by Free State Geduld. Things were also helped by the Union's decision to lift the State of Emergency on Wednesday and by continued demand for gold on the London bullion market.

The impact of all this on prices in an oversold market was sharp. The movement carried on until Wednesday morning and lifted Free State Geduld from the previous Thursday's price of 117s. 6d. to 129s. 4½d. During the same period Western Holdings were boosted by rumours of high development values and rose from 118s. 9d. to 131s. 3d. while in the Finance group Anglo American Corporation moved up from 148s. 9d. to 153s. 1½d. However, by noon on Wednesday buying petered out and a little profit-taking brought the advance to a halt. Free State Geduld closed at 127s. 6d., Western Holdings at 128s. 9d. and Anglo American at 152s. 6d.

It may well be that the market will soon revive—particularly in view of the fact that the Anglo American group O.F.S. dividends are to be declared next week. But there is bound to be some uncertainty in front of South Africa's referendum which is to be held on October 5.

The other main event in mining markets last week was the sharp advance in tin share prices. This followed the decision of the Tin Council—announced before the weekend—to free tin production from all restrictions in the final three months of this year. As far as the share market was concerned it took until Monday morning for the news—aided by weekend Press comment—to really sink in. When that happened the response was swift indeed, particularly in the shares of those mines which still have considerable excess capacity.

Southern Malayan bounded to 24s. 4½d. before closing 3s. up at 23s. 6d. Sungei Besi (29s. 3d.) and Tronoh (41s. 3d.) were also 3s. higher and Tanjong put on 1s. 6d. to 28s. 3d. These initial rises were soon pared by the inevitable profit-taking that developed on following days, but the undertone of the market remained firm enough. Geevor, however, stayed very dull at 18s. following the not very encouraging annual report.

Copper shares remained largely out of the picture. There was a small resurgence of interest on Tuesday, particularly in Rhokana (48s. 9d.) in view of the company's coming final dividend, but the market became dull again on Wednesday. Any bullish effect on share prices of the African Copperbelt wage settlement was outweighed by the steady erosion in the metal price. Elsewhere, lead-zincs remained quiet apart from some Australian demand for Mount Isa at 55s. Consolidated Zinc (77s.) were unmoved by news of the Tasmanian aluminium project.

Publications Received

Canadian Mines Handbook, 1960, *pp. 312, published by Northern Miner Press, Price $3, paper bound, $5 deluxe binding.*

A few years ago the emphasis in Canadian mining was on the glamour metals — uranium, columbium, lithium and the like. This year the pendulum's swing has brought attention back to their more common cousins — iron, copper, nickel and zinc. Developments in iron ore alone are such that in a few years its production value will be close to $700,000,000 annually, a sum greater than that of Canada's total annual mineral output a dozen years ago. As for the other metals, new projects are under way from New Brunswick to the Yukon, from Vancouver Island to the outer coast of Newfoundland.

The 1960 Canadian Mines Handbook lists over 3,500 companies, including more than 200 new organizations. Alphabetical arrangement and larger type size permit easy reference and reading. All pertinent statistical data, including directors, capitalization and financial position of Canadian mining companies, are provided. As in the previous edition, first quarter production and earnings, latest dividends and the most recent information on operations and mine development, where available, are shown.

Year Book of the American Bureau of Metal Statistics, *39th Annual Issue for the year 1959. pp. 139. New York. Price $4.50 for Hard Cloth Covered Edition and $4.00 for Soft Paper Edition with 25c. for postage outside the U.S.*

This international survey compiled by the Bureau is sponsored by the most important producers of copper, lead and zinc in the New World, and records for 1959 and prior years, mine production, smelter production, consumption, imports and exports, and other economic statistics of many metals on a world-wide basis. The Year Book provides voluminous statistical information for market analysis, research and industry surveys.

We have received from the Geological Survey Department of Cyprus Memoir No. 2, entitled *The Geology and Mineral Resources of the Peristerona-Lagoudehera Area* by J. M. Carr and L. M. Bear; and Memoir No. 3, entitled "The Geology and mineral resources of the Akaki-Lythrodondha Area," by L. M. Bear. Both these books are illustrated with photographs and diagrams, and include geological maps, and are priced at £1 each.

Two recent publications are now available from U.S. Department of the Interior, Bureau of Mines Bulletin 583 entitled *A Glossary of the Diamond-drilling Industry* which is obtainable only from the Superintendent of Documents Printing Office, Washington 25 D.C., Price 35c., and Report of Investigations 5616, *Safety with Mobile Diesel-powered Equipment Underground,* which may be obtained from the Bureau of Mines Publications-Distribution Section, 4800 Forbes Avenue, Pittsburgh 13, Pa.

Statistical Summary of the Mineral Industry, *Prepared by the Overseas Geological Surveys, Mineral Resources Division; published by H.M.S.O., London, pp. 389, £1 7s. 6d.*

This statistical summary covers a period of six years, and shows world production, exports and imports of all the important economic minerals and metals. This edition covers the period 1953 to 1958. Production tables for cobalt, copper, lead, tin and zinc give not only the output of the relevant ores in terms of metal but also the output of metal. So far as possible the latter tables give the amount of primary metal obtained showing separately, wherever important, production of secondary metal. Thus it is possible to see at a glance the amount of new metal available in any year. Full statistics are given for the minor metals, and the sections on coal and petroleum are very comprehensive. Statistics for all the principal non-metallic minerals are also included.

Bibliography of South Australian Geology, by E. N. Teesdale-Smith, is published by the South Australian Department of Mines and Geological Survey and comprises pp. 235. This bibliography includes all articles, books and pamphlets which contain data on the geology of the state published up to and including June 1958. The works are indexed under the authors' names in alphabetical order, and a very brief abstract of each is included.

*

Babylon to Birmingham, compiled and edited by H. G. Cordero and L. H. Tarring, and published by Quin Press, Ltd., London, at £3 post free, is a review of the development of the metal industries throughout the world from pre-historic ages till the present time and is written to appeal to all readers interested in the metal trades.

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Topographic Instructions, Multiplex Plotter Procedures, Book 3, Chapter 3F4, 1960, is published by the U.S. Department of the Interior, Geological Survey, Washington, Price 45 c. It comprises pp. 45. The Geological Survey topographic instructions describe the engineering standards, methods and procedures used by the Topographic Division in the production of topographic quadrangle maps.

Although the instructions are prepared primarily for the guidance of survey workers, private individuals and organizations engaged in similar work may find them a useful reference, and they are therefore being published in a series of volumes.

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This feature appears every fourth week

INDUSTRIAL EFFLUENT TREATMENT

A development of major significance in the topical and vitally important field of industrial effluent treatment and purification was announced recently. Simon-Carves Ltd. and Monsanto Chemicals Ltd. have pooled their very wide research, engineering and operating experience in the treatment and harmless disposal of industrial effluent to form the Simon-Carves Monsanto Effluent Advisory Service. The service is administered by Simon-Carves Ltd. from their headquarters at Cheadle Heath, Cheshire.

Both at home and overseas the Simon-Carves Monsanto Effluent Advisory Service puts a unique range of facilities at the disposal of industries and public authorities faced with problems of effluent treatment and disposal. The service provides general advice on effluent problems, on-site and laboratory investigations on the treatment of specific effluents, recommendations and design data for effluent treatment processes and plants, and continuing advice on the operation of commissioned treatment plants. In addition to the advisory service the full engineering and contracting organization of Simon-Carves Ltd. is available for the actual construction, installation and commissioning of complete effluent treatment plants.

Simon-Carves Ltd., as designers and contractors to the coal carbonizing, gas and chemical industries, have had considerable experience of effluent treatment. In particular, they have carried out in recent years, and are still engaged upon, intensive laboratory, pilot plant and field-scale research and development on the treatment of effluents by biological methods. They have eight commercial-scale biological effluent treatment plants in service, under construction and on order at colliery and steelworks coking plants in the United Kingdom and India, and are dealing with enquiries for treatment of effluents from many other industrial processes.

Monsanto Chemicals Ltd., in the course of developing successful techniques for the biological purification of their own complex effluents, have carried out an intensive research programme for many years. They have successfully pioneered in the United Kingdom processes in which industrial organizations and public authorities throughout the world have long been interested. The research, design, engineering and operating data resulting from this work, and from the continuing operation and development of the massive effluent treatment installations at their factory at Ruabon in North Wales, are now available to all interested parties through the Simon-Carves Monsanto Effluent Advisory Service.

It is interesting to note that representatives from most industries will be attending The First Effluent and Water Treatment Exhibition and Convention to be held from October 18 to 21, at The Seymour Hall, London. This fact is evident from the large number of registered delegates.

Industries represented by delegates include oil and petroleum, coke, iron and steel, coal and atomic energy. Delegates have registered from countries including Holland, S. Africa, Rhodesia, Germany, Australia and Canada.

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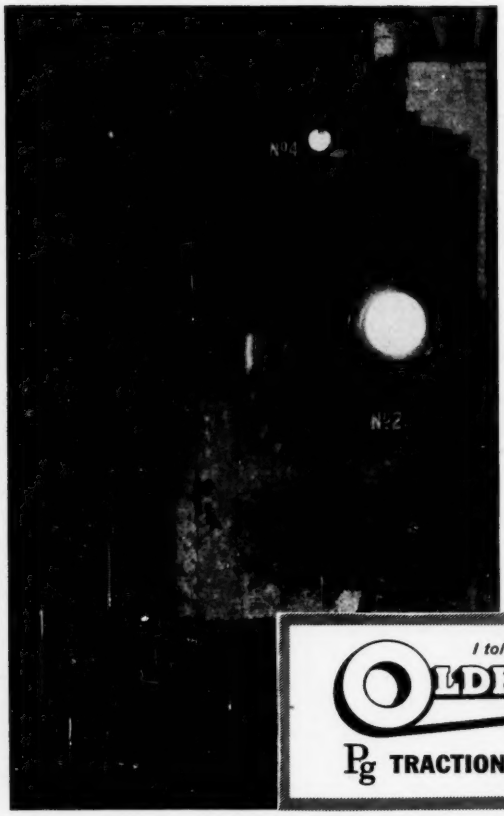

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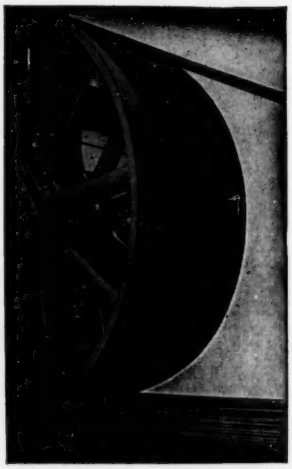

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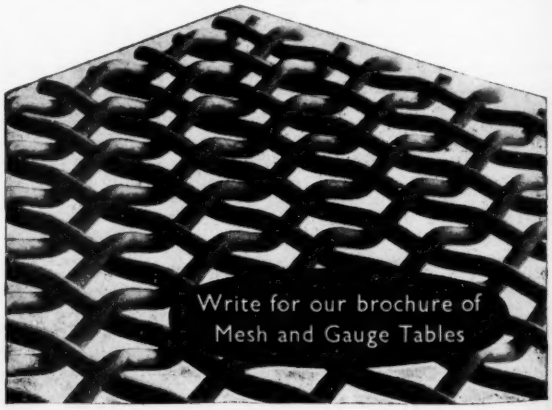

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Gold, 250s. 2½d.
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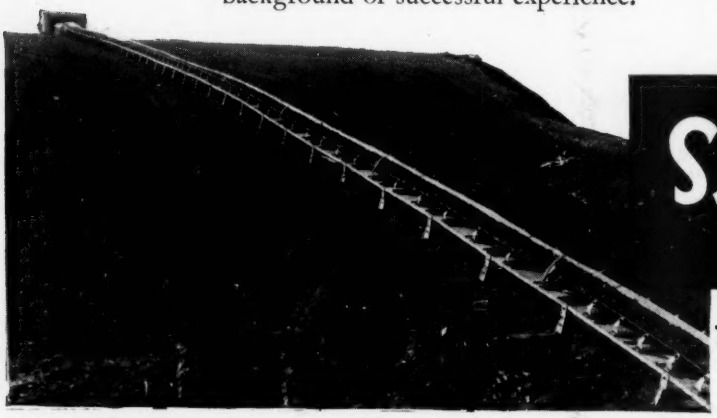

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